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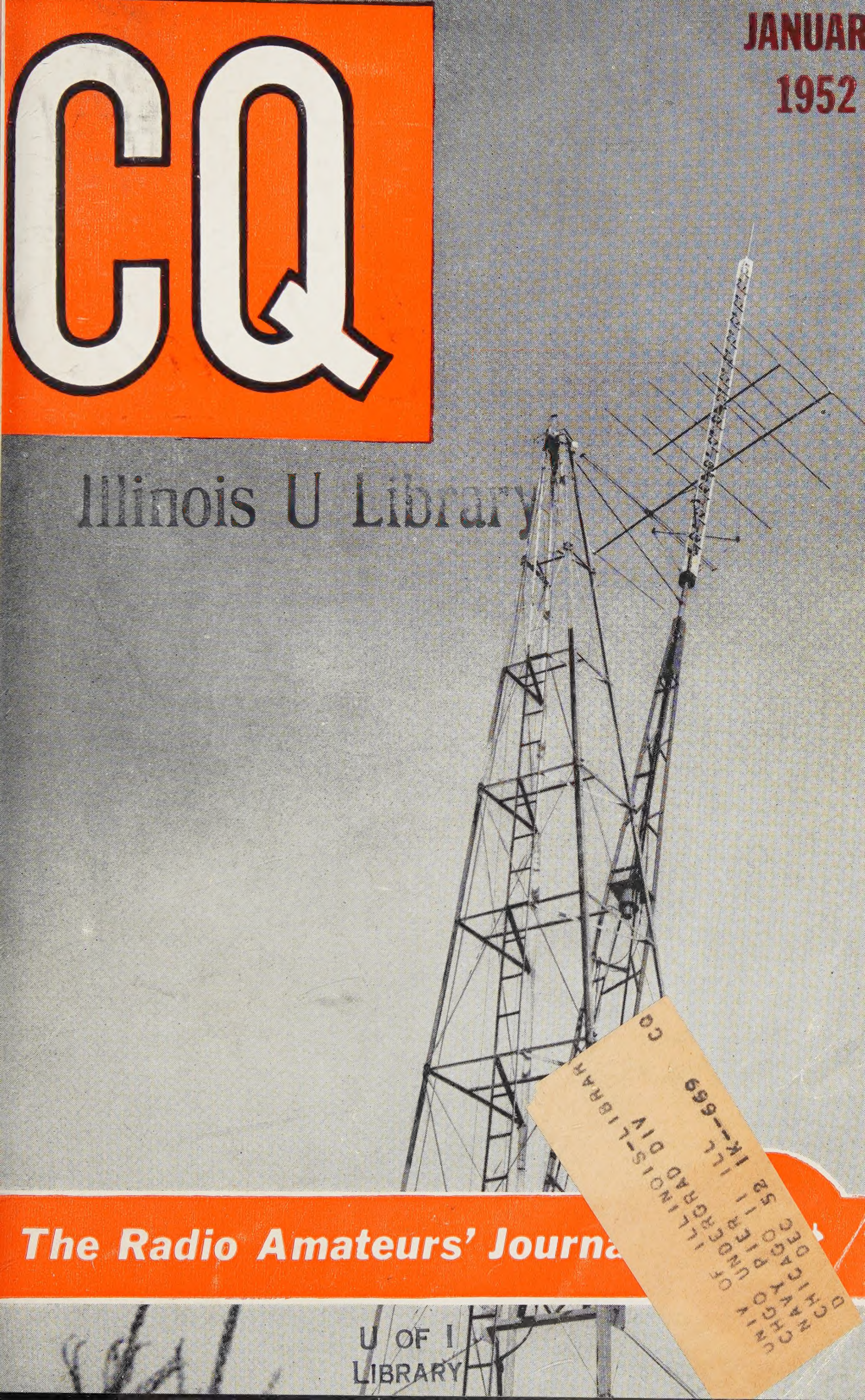

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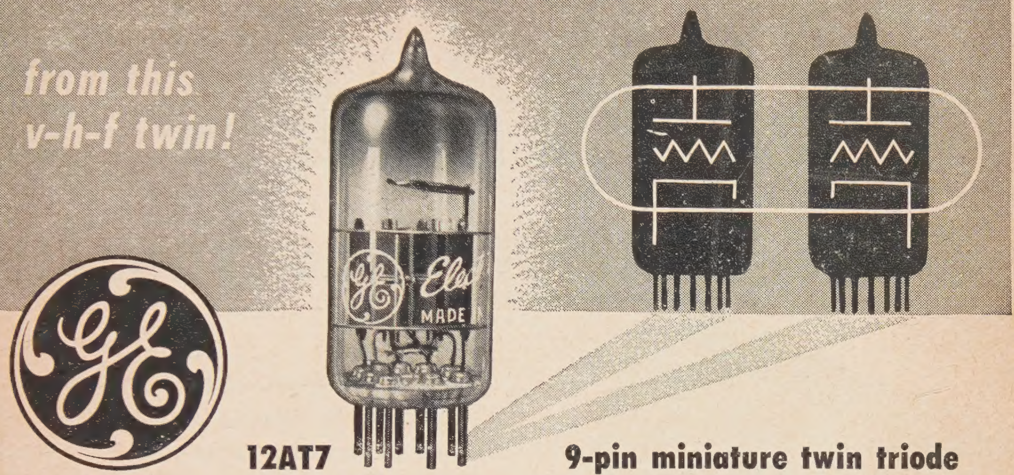

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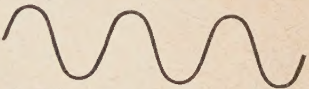

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● Looking ahead to the time when the ultra-highs and super-highs will carry ham traffic, G-E engineers pioneered transmission-reception in the extreme upper range of the spectrum. On April 29, 1946, W2RYT and W2RMA of Schenectady opened the 2,300-mc, or ⅛-meter band. On May 18 of the same year, W2RDL and W2UKL of Schenectady opened the 21,000-mc, or 1/70-meter band. New performance horizons, new knowledge, new experience—these, gained by G. E.'s many electronic "firsts", become advanced design and plus value in General Electric tubes you buy!

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Foreign Subscription Representatives: Radio Society of Great Britain, New Ruskin House, Little Russel St., London, WC 1, England. Technical Book & Magazine Co., 297 Swanston St., Melbourne C1, Victoria, Australia.

VOL. 8 NO. 1

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OUR COVER

No, this is not an experiment in tilting your antenna to change the angle of radiation. It is the rotatable top section of Eddie Warburton's, VE3AZV, Oshawa, Ont., tower being lowered for tuning adjustments. Visible on the top section are 5-element beams for 6 and 10 meters. An article is contemplated on the construction of this unusual tower.

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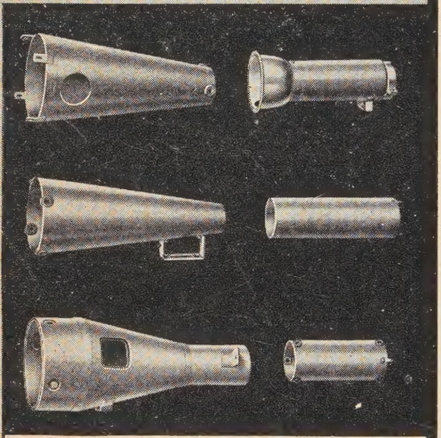
CQ—(Title Reg. U. S. Pat. Office)—is published monthly by **Cowan Publishing Corp.** Executive and Editorial offices at 67 West 44th Street, New York 18, N. Y. Phone MUrray Hill 7-2080. Reentered as Second Class Matter February 6, 1951 at the Post Office, New York, N. Y. under the Act of Mar. 3, 1879. Subscription Rates: in U. S. A. & Possessions, Canada & Pan American Union—1 year $3.00; 2 years $5.00. Elsewhere $4.00 per year. Single copies 35 cents. Printed in U. S. A. Entire contents copyright 1951 by Cowan Publishing Corp.

Designed for Application



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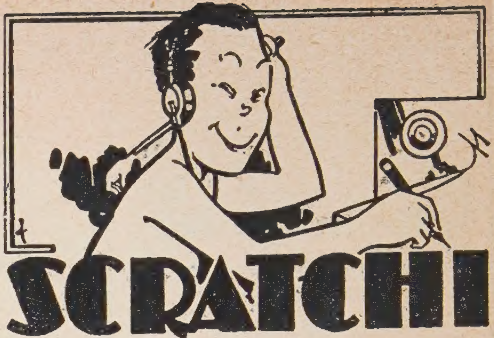

SCRATCHI

Feenix, Ariz.

Deer Hon. Ed:

Recently I are deciding that my rig are dew for overhawling. After all, it being three years old, and what is it. Just a hi-powered phone see-w rig with regular modulation and the usual assortment of parasitics. As an amchoor I feeling I falling behinds the time if I not getting some of this new type of doo-dads in rig, like signal sideband or clamp toob modulation. Are listening on ham bands to seeing what other fokes using, and after cupple days are deciding that clamp toob modulation are more so desirabull than signal sideband, on acct. not having to change rig much. Besides, are having cupple of clamps already, so not involving much cost to trying clamp toob stuff.

I'll saying this first thing right off. Scratchi are learning a great many things about clamp toob modulation. For instance, I not bothering to do any reading on the subject, because nothing are more obvious than what is clamp toob modulation. I digging up pair of C clamps from basement where they have been since I got in trubble with Hon. Brother Itchi. That are time that I winding the C clamps with eleventeen turns of wire to making electromagnets. They working fine, only I using battery from Itchi's car, and evidentally taking too much jooce, because Itchi not being able to start car next morning.

After taking wire off C clamps I deciding I better not modulate final with them, as they not looking big enough to modulate five kilowhats, so deciding to fasten them on one kilowhat buffer toobs. First thing I learning is that you can't modulating too hard. If you do, you breaking toob. Lucky Scratchi are having spare toob, so replacing one I breaking and finally get C clamps holding on the toobs. Next are turning off regular modulators, putting old copy of Handbook on the key, and trying rig. It seeming normal, except plates of toobs are hotter than usual. Now, needing to connect mike into circuit, so making connection to the C clamps. One mike lead on one clamp, and the other mike lead on the other clamp. Frankly, it not looking like it can work, but who is Scratchi to argue with other grate radio geniuses.

Six hours, two pots of coffee and one pack of cigarettes later I are sure the idear are tecknickly a lot of hooey. I are making with seek-you until are so red in face Scratchi looking like Indian, and not getting one single answer. In fack, are even wondering if receiver is working. All I heering on air is all the amchoors talking about the television station they heering on ham band. I listening, and listening, and I not heering anything like TV station.

(Continued on page 64)

LEO I.
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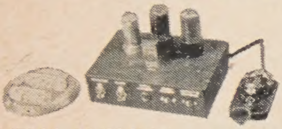

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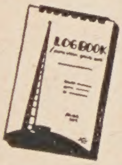

RADIO REFERENCE MAP

25¢
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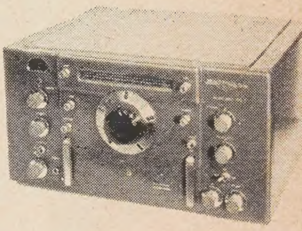

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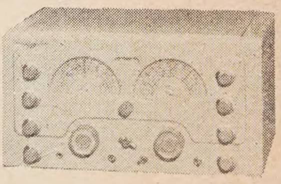

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Re "Another Standard of Comparison"

A search through the amateur magazines for 1951 will readily show that Bill Scherer's, W2AEF, fine article on the all-band mobile receiver (November, *CQ)* deserves top honors for detail and completeness. Unfortunately, time did not permit the checking and rechecking this type of article deserves. This resulted in the appearance of a number of errors—most of which were easily detectable. W2AEF has prepared a summary of these to set the record straight.

The following errors appeared in *Figure 1:*

Capacitor above *R31* is *C31.*

C30 is omitted, but see *Fig. 6* for connections.

R24 and *R25* also left out, but see *Fig. 5.*

The mixer coils are slug tuned.

C18 should be fixed silver mica 50 μμf.

C52 is fixed, not variable.

B plus lead from 6BE6 should go to the right side of *R32,* not left.

The first 6BJ6 is 1st IF, not RF.

In *Fig. 3,* right hand chassis, *V3* should be at front, *V1* at rear.

In *Fig. 5, R12A* should be *R15* and is 2,000 ohms.

In *Fig. 6, C6* at left of *R4* should be *C8.*

Text on page 11, sensitivity should be 0.5 μv, not 1.5 μv.

On page 16, next to the last paragraph, after *R15,* insert *C46.*

On page 17, first line last paragraph, *C6,* should be *C8.*

Bill also passes along some sample correspondence he has received concerning his latest endeavor.

" . . . congratulations on your fine article. . . I've already made up a parts list. . . "

W9PXP, ex-W3MOR

" . . . my past experience with convertor-audio radio combinations has left much to be desired. . . I think your approach is correct. . . "

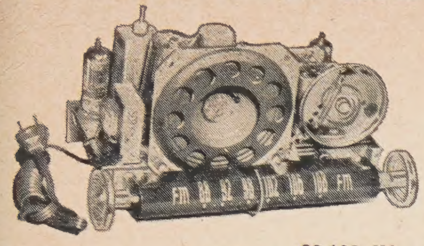
ex-W9WPQ

" . . . this article contains sufficient design detail to make it stimulating reading. . . "

W9DOR, W9EUG and W9EDD

(By the way, the Defiance condenser is available from the Hudson Radio and Television Corp., 48 West 48th St., New York 19, N.Y. Tell Mr. Sol Baxt that we sent you—Editor.)

Special Purchase FM Radio Chassis



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2-12BA6	1-35W4
1-35B5	

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374	405	436	507	440	463
375	406	437	508	441	464
377	407	438	509	442	466
379	408	481	511	444	468
380	409	483	512	446	469
381	411	484	514	447	470
383	412	485	515	448	472
384	413	487	516	450	474
385	414	488	518	451	475
386	415	490	519	452	476
387	416	491	520	455	477
388	418	492	522	457	479
390	419	493	525	459	480
391	420	494	526	461	
392	422	495	530		
393	423	496	531	**99c EA**	
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397	427	504			
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6040	6973	7940	3735	5873	6475	7473	7706
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6106	7773	8273	5677	5906	6540	7540	8240
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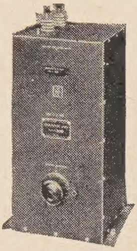

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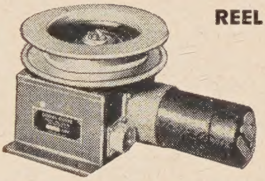

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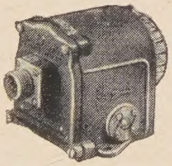

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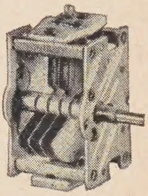

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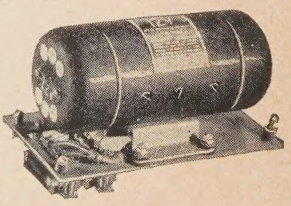

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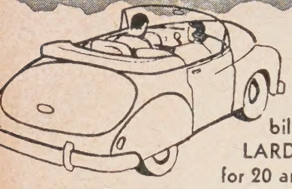

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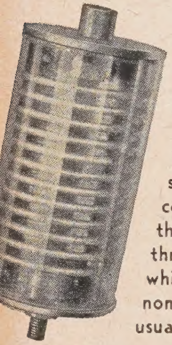

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• Heavily plated 1/8" solid copper wire. • Heavy flexible copper strap permits exact inductance adjustment. • Sturdy, weatherproof housing of 1/8" thick plexiglass. • Removable threaded plastic nylon end-caps. • All metal parts of brass heavily nickel-plated.

MALLARD HI-Q 20 Loading Coil
Amateur Net $8.95

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★ ★ *Letters* ★ ★

Amateurs Commended By FCC

Washington 25, D.

Editor, CQ:

The Commission, through the medium of a public noti dated April 25, 1951, informed radio amateurs of propos large-scale military maneuvers to be staged in North a South Carolina during the period of August 8 to Septe ber 7, 1951, requiring that the frequency band 3700-39 kc be made available temporarily for military use. Am teurs in specified areas were requested to refrain, volu tarily, from operation in this band—entirely in so areas and in others only during night hours.

It gives me great pleasure to advise that I have r ceived a letter from Major General George I. Back, US Chief Signal Officer, Department of the Army, expressin appreciation for the manner in which the radio amateu of the United States cooperated in making those freque cies available to the military during the Army-Air For Maneuver Southern Pine. General Back's letter reads i part as follows:

"I wish to express my appreciation for the splendi cooperation of Radio Amateurs in connection with th recent Army-Air Force Maneuver Southern Pine.

"The arrangement made by the Commission for volu tary cooperation by Radio Amateurs in making the fr quency band 3.7—3.9 mc available for military operatio proved to be completely satisfactory. Extensive use o frequencies within this band was made by units pa ticipating in the maneuver and no instance of inte ference from U.S. Radio Amateurs was reported.

"In expressing my thanks for the assistance of th Commission and its staff in connection with Souther Pine, I would like to request that you express the appreciation of the Military Services to the Radio Amateu populace for the service they performed."

Again, through the pages of your magazine, the Commission wishes to commend the licensed radio amateur who once more justified the faith it places in them. Perhaps, deserving of special mention are those newcomer to the ranks of licensed amateurs, the Novice licensee who obtained their first licenses after July 1st and, thoug already limited to operation in three narrow frequenc bands, voluntarily refrained from operating in the desirable 3700-3750 kc band until after September 7th, as requested.

Sincerely yours,

Wayne Coy, Chairma
Federal Communications Commissio

Fast Action Wanted

168 Castlefield Ave.
Toronto 12, Canada

Editor, CQ:

I'm not kidding about fast action wanted. I do mean fast.

Having been a ham for 30 years I have seen the gradual loss of our frequencies, and I can tell you that unless we can prove use of our frequencies we won't have any after the next Telecomm' Convention.

We must use all we have, for instance, the QRM on the low end of 20 is senseless when there is 100 kc at the high end that is only used by a few phone stations. For months I've been trying to get fellows to move to the high end, and have had exactly **one** QSO up there. Wake up chaps before it's too late, use all of the bands we have left, let's not congregate on one end and leave the other free for the snatch that will be put on.

How about meeting me up there and proving to your FCC and the rest of the world that we need these freqs.

The above goes for all our bands.

73,

Val Sharp, VE3L

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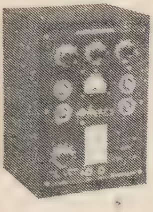

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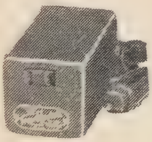

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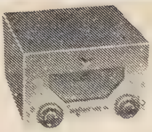

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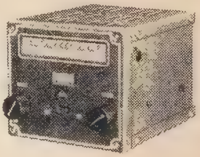

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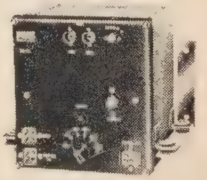

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ZERO BIAS

EDITORIAL

Regarding Priority Order M-85

No small amount of confusion has arisen as a esult of the National Production Authority's Orler M-85. Basically, it is of great import to the verage radio amateur. The NPA order is couched n terms that may make it difficult for the laymen o comprehend, but what it says in its simplest erms is the Government recognizes the importance of the amateur to the national defense effort and as done something to insure cooperation by hams.

As every one knows, the constantly accelerating ace of national defense is cutting deeply in supplies of certain critical materials. Amateurs who ave tried to purchase a certain item for their tations may have had to try half a dozen sources efore locating it, and suppliers are having equal ifficulty in keeping adequate inventories of many carce items. And the worst of these shortages is et to come. M-85 is created to give amateurs a riority to obtain these scarce items, within certain efinite limits, for their stations and to give their uppliers a priority to extend on down to the manuacturer. M-85 covers *all* licensed amateur radio perators and certain members of the CAP.

Hams who are members of national organizations r networks (such as MARS, AEC, etc.) are alowed to extend a priority for material with a dolar value not to exceed $200. Any other amateur, at is, an amateur not a member of the special rganizations, may place a self-rated order not to xceed $100. The orders may be placed up to the ollar limit on a single purchase, or may be cumuative over several orders. If equipment cost totals n excess of the maximum allowed, two or more mateurs may combine their quotas. This order is n effect until August 31, 1952.

The amateur priority rating is self-assigned (by e ham to himself) and need apply only on porons of an order which are essential. For example, n antenna order for wire and insulators can have e priority extended on only the wire. For almost ll orders to be covered with a priority by an amaeur, the symbol DO-MRO will apply. For certain aterials such as copper, aluminum or steel in the rimary forms only, the symbol MRO will apply; ut this unusual special case is covered in detail n the order and is not likely to be of concern to ost amateurs. (Additional details may be obtained rom Department of Commerce Field Offices.) Vhen placing an order to be covered by a priority is only necessary to write on the order (either ail order or on a distributor's order pad) DO-MRO and the certification:

Certified Under NPA Order M-85 for Amateur Radio Station Use Only

(The certification is then signed by each amateur radio operator against whose quota the order, or any part thereof, is charged. Each signature is followed by the call letters assigned by the FCC to that operator.)

To sum up, when purchasing items using scarce or critical materials, or items that the electronic parts distributor is having difficulty obtaining from a manufacturer without a priority, *amateurs should exercise their right to extend the DO-MRO properly certified.* The electronic parts distributor can then take this priority and give it to a manufacturer to replenish his own inventory. Thus, the proper use of the priority is essential to keep the normal flow of scarce materials during the present national emergency. Use your priority! You will be doing a service to other amateurs and the parts distributor. But do not use it unless you are utilizing the materials to keep your gear on the air and in a position to serve your community in civil defense or other specially approved activities!

The DX Department

For many years *CQ* has been known throughout the world because of the outstanding DX column conducted by Herb Becker, W6QD. In the post-World War II era, W6QD, assisted by the extremely able DX Committee consisting of Guy Dennis, W6DI; Andy Elsner, W6ENV; George Sinclair, W6GAL and Edward Hayes, W6SA, not only succeeded in making the column "must" reading for every DX man, but helped launch many innovations for the betterment of this phase of the hobby. It was this group that inaugurated the CQ-DX Contest which, in three years, has become one of the outstanding operating events in amateur radio.

DX is a serious business and *CQ* has treated all of its aspects with the judgment and maturity that only experienced DX men could bring to the complex art. As the pressure of W6QD's business continued to double, it became apparent to him that in all fairness to his column, and his business, it would be necessary to lighten his load. Thus began the search for a DX Editor who could fill his shoes. The unanimous choice of the DX men participating in the selection was Dick Spenceley, KV4AA. Many readers may ask why was a station outside the Continental limits of the U. S. chosen. It is that very reason which motivated the selection of KV4AA, located in a strategic geographical spot he is at the crossroads of much choice DX of the world. An active DXer and holder of many DX records there are few, if any, amateurs who know more about the goings on throughout the world than Dick. As KV4AA takes over as the new DX Editor, he brings to an end the longest stint in amateur column history—the DX News reported by W6QD. Herb continues as a member of CQ's DX Committee which will act as final aritrators on all matters pertaining to DX policy nd the WAZ Honor Roll. The addition of Dick penceley to the staff of CQ greatly strengthens s ability to continue to do an outstanding job in the field of DX.

O. P. F.

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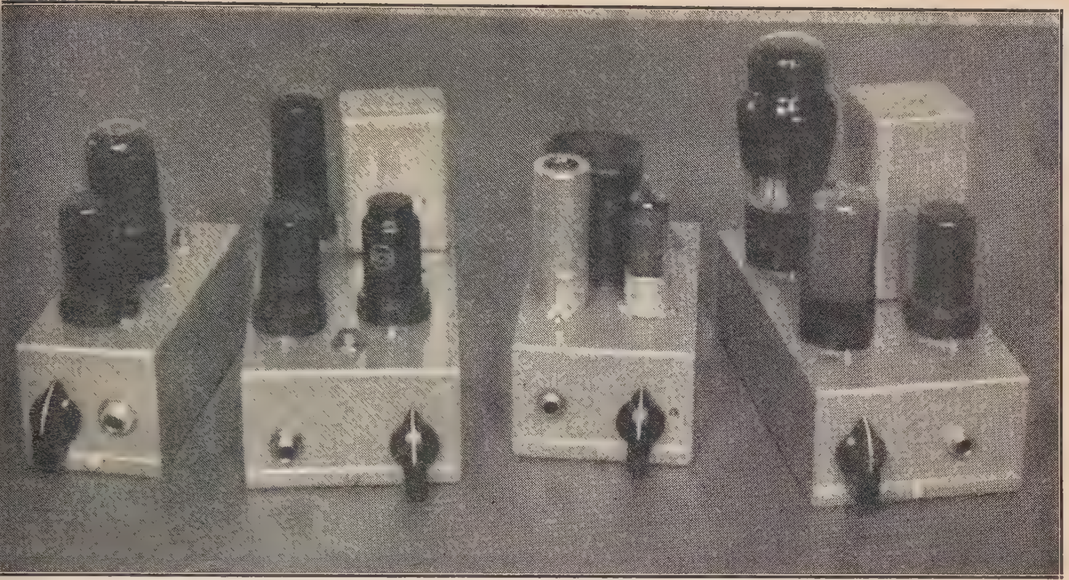

Some Experiments with
Screen Grid Modulation

FRANK C. JONES, W6AJF*

Here's a man that CQ readers haven't heard from for quite some time. Before World War II, W6AJF developed considerable prestige with his work on cathode modulation. Just to keep his hand in, Frank has been experimenting with various screen grid clamp and controlled carrier systems. His interesting results are reported in this article—Editor.

Screen grid modulation of tetrode or pentode r-f tubes provides an economical method of obtaining satisfactory voice modulation. In a late modulated system, the modulated r-f stage fficiency is usually quite high, ranging from 60 o 80%; however, the audio power amplifier (moduator) may add considerably to the transmitter cost nd size. Most other forms of modulation may be lassed as "efficiency" modulation since in these ystems the class C state output efficiency must ncrease during modulation to produce the required ositive peak output. Control grid, cathode modula-ion, suppressor grid, and screen grid modulation ll produce a change of efficiency and instantaneous late current to effect modulation of the r-f stage, hereas in plate modulation the current and volt-ge are both doubled to obtain the peak power conditions at 100% modulation. Cathode modulation can be set up midway between these conditions if enough audio power is available.

Grid modulation, of any form, is seldom set up to produce 100% modulation. Figures of from 80 to 90% are of a more practical value since higher resting or carrier efficiency and less troublesome circuit adjustments nearly always result with these reduced requirements. Screen grid modulation is less critical in adjustment with most types of screen grid tubes than other grid modulation systems. Occasionally a tube will have some peculiar screen grid characteristic which makes it difficult to obtain fairly good quality for voice communication. This difficulty is more noticeable when attempting to use screen grid modulation of the controlled-carrier type than in the more usual form of steady carrier modulation.

Eight screen grid modulation systems have been built at W6AJF and tested on several amateur bands during the past two years. Four of these units are illustrated and described in this article. Various r-f tubes have been modulated with more or less success in these tests; such as an 807 on 160 meters, a pair of 813s on 75 meters, an 829B or 3E29 on 2, 6 and 10 meters. Three modulators produced steady carrier conditions and five, controlled carrier. Controlled-carrier systems, espe-

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P. O. Box 708, Sonoma, Calif.

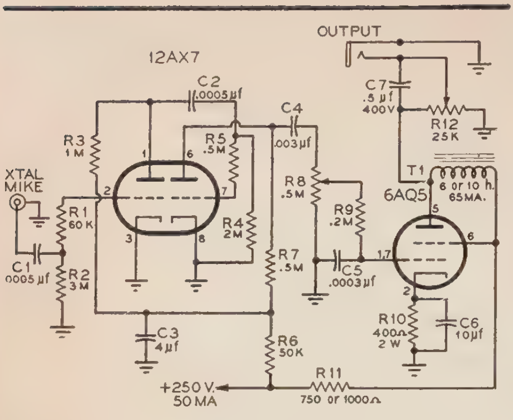

Fig. 1. In the first experimental circuit a speech clipper and limiter effect arises through the use of a 12AX7.

cially where the resting carrier was very small, generally produced more TVI in the vicinity of W6AJF than steady carrier with either plate or screen modulation.

Controlled-Carrier Results

Controlled-carrier modulation can be narrowed down to two basic systems. In both, the carrier amplitude varies in accordance with the audio frequency, usually at a syllabic rate. However, in one system the average carrier level is made to vary at syllabic rate and in addition the carrier is amplitude modulated in both negative and positive directions by the a-f wave. In the more simple system, the negative audio portions of the a-f cycle are clipped off and the positive half cycles are used to modulate the class C r-f amplifier. This system requires no special time constant filter and rectifier in the output of the audio amplifier or modulator and so results in considerable savings in cost, space and number of tubes and parts. The carrier increase is nearly instantaneous with speech application where there is a little lag in the older systems. The human ear can stand a lot of distortion without becoming too annoyed, and the loss of most of the negative half cycles of speech in the new systems of controlled carrier modulation is permissible. With a sine wave input the a-f signal into the modulated stage is a series of positive half waves with little left of the negative half waves. The final result at the radio receiver output shows the zero axis moved up so the output wave has rounded sine wave positive tops and squared negative peaks. The resulting distortion to the ear is noticeable but the speech is quite intelligible and sounds no worse than many plate modulated rigs on the air when not properly adjusted.

To produce the same loudness of output in the other fellow's receiver it is necessary to supply twice as much modulating voltage to any system which clips off half the modulating wave. However, the actual peak-to-peak swing of the screen-grid voltage of the modulated stage should be t same for positive cycle controlled carrier oper tion or for steady carrier operation. The modulat r-f tube will run cooler and last longer with co trolled carrier, but this extra life is obtained the expense of good voice quality. Many operato object to the characteristics of controlled-carri systems.

One disadvantage of a controlled-carrier syste is the operator's tendency to hit it too hard wit a.f. and produce overmodulation, splatter and wid band emission. Splatter can be just as bad wit positive peak flattening as with negative pea clipping in a modulated r-f stage. Either positiv or negative peaks of a.f. can be clipped withou producing excessive splatter, if clipping is accom plished in the a-f system (the limited bandwidt of the a-f circuits and transformers tend to sup press the harmonics. The popularity of speech clipper and filter systems clearly demonstrates thi point). But, any r-f class C stage has limits o positive as well as negative modulation peak which, if exceeded, will produce bad splatter. A careful examination of the modulated signal with an oscilloscope will convince any skeptic withou his fellow amateurs resorting to a baseball bat Some controlled-carrier modulators can be pushed so hard that the antenna r-f indicator and plate milliammeter will indicate efficiencies and r-f output comparable to plate modulation, but in mos cases splatter (and TVI) will be terrific. If the d.c. plate voltage is set to twice the value used in a plate modulated rig (for example, 1200 volts on an 807 or 829B) good positive peak linearity can be obtained with high output, but the peak plate current may be too high for the emission characteristics of the modulated tube and so shorten the tube life. Sometimes this is of little importance as has often been the case at my own station. But doubling the d.c. plate voltage on a pair of 813 tubes to 4000 volts or so seems ridiculous. Thus, screen-modulating a kw input to those tubes isn't so easy! In experimenting with several systems at W6AJF, trying to run more than a half kw input to 813s or 4-125As with 1800 to 2000 volts plate supply produced excessive positive peak flattening on the scope picture at 75 and 2 meters. The writer is a little ashamed to admit running inputs up to 700 watts on *2* meters before becoming aware of this effect and its attendant splatter some months ago.

Antenna Coupling

In all forms of screen grid modulation, the antenna coupling must be tighter than with plate modulation. The usual procedure with steady carrier systems is to increase the antenna coupling adjustments beyond the point of maximum antenna feeder current. The coupling should be great enough so there is relatively little dip in plate current at resonance and the antenna current indicator shows 10 to 20% less than the maximum obtainable at the normal d.c. screen voltage. Repeating, this drop off must be on the over coupling side rather than undercoupling. The maximum permissible d.c. screen voltage is that which produces what the particular amateur operator considers a safe plate color for his r-f tube. The d.c. plate voltage should be as high as possible and control grid drive the same as used in c.w. operation. In general, the d.c. screen voltage must be reduced to a value of one half that which would be used for c.w., for example, 125 volts to an 807. The plate current will normally be at least half of the c.w. value since the antenna coupling is very tight. Usually the adjustments of screen voltage, antenna coupling and audio input are all a compromise to achieve values which permit a reasonably high carrier with 80 to 90% modulation capabilities and still stay within the allowable plate dissipation ratings of the modulated tube. If the d.c. plate voltage is very high the antenna coupling adjustments are nearer those used in normal c.w. operation. No hard and set rules can be laid out for proper adjustments, but a few minutes of work will easily determine the optimum adjustments for a particular transmitter.

Modulator Experiments

The four modulators illustrated were experimental units built into small shield boxes. Shielding from r-f fields was required since all models were built for use with a crystal microphone. A small power supply delivering 250 or 400 volts was plugged into each unit under test. The modulator output was plugged into a jack on the transmitter wired so as to cut out the internal screen supply circuit. Any of the modulators shown would modulate an 807 or two, an 829B, a 4-125A or even a pair of 813s. Other units not shown were also tried. For example, one bulky controlled carrier modulator had 6L6 push-pull class AB_1 tubes driving a power rectifier and the screens of the r-f stage in a modification of early day controlled carrier systems. The results were so little improved over the more simple "positive" a-f cycle modulators that it was discarded.

Circuit 1

The ordinary screen grid modulator shown in *Fig. 1* with a 12AX7 and 6AQ5 tube combination is about as simple a system as can be built. It has the features of a clipper and filter built into the speech amplifier. The 12AX7 high mu twin triode acts as a two stage amplifier-clipper, with low frequency attenuation in the front portion and high frequency harmonic attenuation following the second and main clipper or limiter. For low a-f speech levels, both sections of the 12AX7 act as high gain amplifiers. The a-f gain control and low pass filter (RC circuit) follows the limiter and permits any desired drive to the 6AQ5 (or 6V6) modulator tube. The 25,000 ohm wire wound potentiometer (*R12*) in the output adjusts the d.c. voltage to the screen grid of the modulated r-f tube. The capacitor across the top section of this potentiometer serves to bypass the a-f output of the 6AQ5 directly to the screen of the modulated stage. It prevents unnecessary loss of a-f power in the potentiometer and also increases the "percentage of modulation" of the d.c. screen voltage. It has a secondary purpose of maintaining a more constant load on the modulator tube. With some tubes the screen grid impedance varies from perhaps 5000 or 10,000 ohms at the peak of modulation to as high as 50,000 ohms at low levels of modulation.

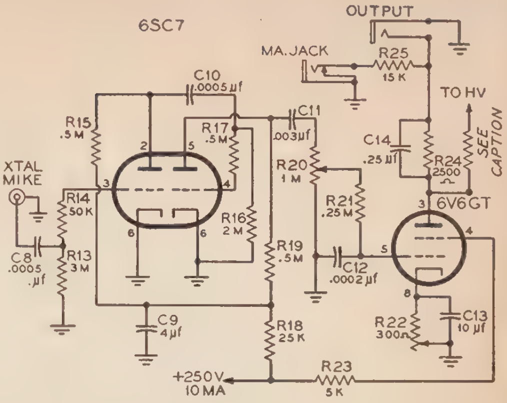

Fig. 2. In the second circuit a high wattage resistor is necessary in the plate of the 6V6. It is mounted external to the modulator unit. See text.

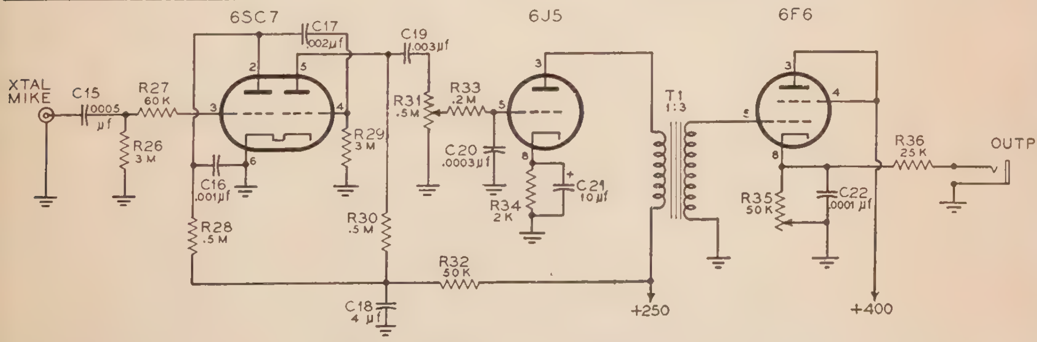

Fig. 3. The third experiment was also with controlled carrier screen grid modulation.

Circuit 2

The modulator shown in *Fig. 2* is primarily for controlled carrier operation with the 6V6 cathode resistor *(R22)* set at zero bias. This will drop the d.c. screen voltage on the r-f tube to 30 volts or so and increase it to 175 volts or more (on a d.c. voltmeter reading) when modulating. The 6SC7 speech amplifier acts as a limiter on speech peaks, but not quite as effectively as the higher gain 12AX7 tube. The 6V6 acts as its own peak limiter by clipping off the positive cycle peaks at its grid. This leaves the positive-going half cycles of plate current to modulate the r-f tube screen circuit. This system seems to work about as effectively as connecting a diode across the 6V6 grid circuit for producing the controlled carrier effect. The setting of the cathode resistor, *R22,* permits operation with either controlled carrier or ordinary screen grid modulation. As *R22* is increased from zero resistance the bias on the 6V6 makes it draw less plate current, resulting in less voltage drop across a large value resistor (external to this unit). The d.c. screen voltage is thus increased to 125 or 150 volts for steady carrier operation. This resistor should be around 11,000 or 12,000 ohms, 100 watt rating, for a 750 volt supply and an 829B or 807s in the r-f stage. A 20,000 to 25,000 ohm 200 watt resistor was necessary for a pair of 813 tubes and an 1800 volt supply. The trapezoidal pattern on a scope showed little negative modulation to the left of the zero modulation resting carrier line. The positive peak modulation showed good linearity up to the point where a d.c. meter read 130 volts on the 829 screen grid, above this level the positive peaks sloped off, and the right hand edge of the scope pattern became excessively bright.

Circuit 3

The modulator shown in *Fig. 3* produces only controlled-carrier screen grid modulation. The 6F6 or 6K6 triode connected tube is normally biased nearly to cut-off by the variable resistor *R35* in the load circuit. The resulting high plate resistance drops the 350 or 400 volt power supply down to 50 or 70 volts on the cathode to ground circuit which is connected across the screen grid of the r-f tube. When a.f. is applied to the 6F6 grid the negative a-f peaks are clipped off, and the positive peaks lower the plate resistance and reduce th voltage drop. The result is a higher d.c. and a.c voltage across the cathode load, the r-f tub screen grid circuit. This modulator worked quit well with tubes such as an 829B but not with a 813 since the latter has a negative screen curren effect at low voltages for certain values of contro grid bias and r-f drive. The 6K6 triode grid circuit requires 200 to 300 volts of peak a-f voltage. No grid current is drawn due to the degenerative effects of the cathode resistor. The quality was good but considerable trouble was had from microphonics and a-f feedbacks, producing howling and other undesirable effects. The first tube in this system should be spaced and isolated in all ways from the modulator tube. The 6F6 cathode to ground voltage runs fairly high on modulation peaks, therefore a separate and insulated filament voltage supply should be used to be on the safe side.

Circuit 4

The modulator shown in *Fig. 4* has some advantages over all other controlled-carrier modulators. No a-f feedback howls were evident in spite of the compact construction and the unit will modulate tubes up to a pair of 813s or a pair of 4-125A tubes. Modulation of a single 807 was also satisfactory simply by reducing the a-f gain control. This modulator is a positive-cycle modulator and functions in a manner similar to a class B a-f amplifier. Since only half a-f cycles are useful, only one "zero bias class B" tube is needed. A 6Y6G tube connected as a high mu triode acts as a gating tube in series with a 400 volt power supply passing only a few ma with no a-f input. This tube draws grid currents so a power triode driver tube, a low mu connected 6V6GT tube, drives it thru one half of an ordinary stepdown class B driver transformer. A 1000 ohm "swamping" resistor (*R48*) from the 6Y6G grid to cathode tends to provide a better load characteristic to the 6V6G triode since the load of the 6Y6G tube is only present on the positive half cycles. The negative half cycles produce practically no effect on the modulator except to completely cut off its plate current flow. To provide a small resting current during this period a resistor (*R49*) of .1 or ¼

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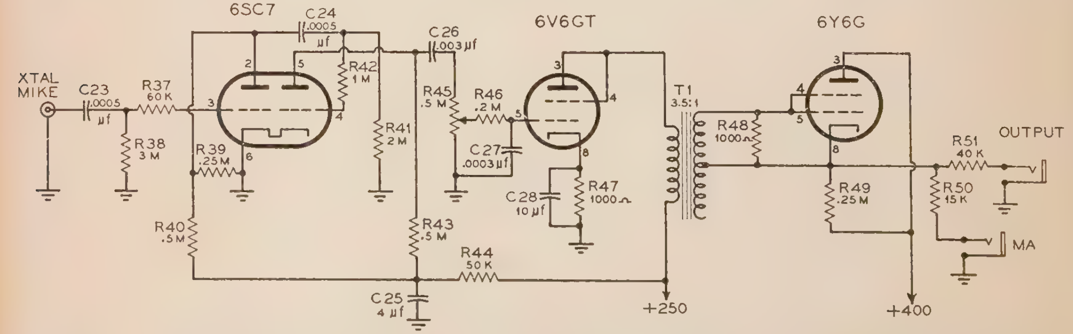

Fig. 4. The best system was found to be a series gating circuit.

CAUTION:

This article is presented in the public interest—however, it is necessary to secure permission from the local telephone company before you can open THEIR instrument.

A tariff has been filed with the FCC which strictly prohibits the use of "foreign attachments." We are publishing this article because we believe that this unit should be described in print. Doubtlessly there are innumerable instances during an emergency when a direct 'phone patch would save valuable minutes. We suggest that if you have a legitimate case for EC work, etc. you take it up with your telephone company and CD coordinator.

—Editor

'Phone Patch

RICHARD C. LITTLER, W8JRG*

"OKINAWA — CALLING OHIO WITH TRAFFIC," a golden opportunity to be of service to a brother ham, but just as we got set to give him a call we just as often heard him stipulating "phone patch". Life seemed so futile while you listened to some smart operator with a *patch* reap the satisfying rewards not once, but repeatedly.

The need of a *patch* fast became an obsession and could only be satiated by building one. All of the textbooks, manuals and handbooks including Ternan, Henney and Alexander B. himself were culled out to no avail, nary a *patch*, only the realization that such gadgets are not "common knowledge".

There were a lot of questions to be answered; e.g., impedance matching, power levels, feedback and switching. Every acquaintance who had worked for the telephone company, in fact anybody who had ever been in a commercial landline office was closely questioned, with darn few answers and quite a few blank stares. However, sufficient information was obtained for a start and that was half the battle.

The transmitter and speech amplifier were examined for impedance and circuitry since they would be important factors in the end result. I was using the "Clipper-Amplifier" as designed by "Lighthouse Larry"[1] with a high impedance dynamic microphone into a 6AU6 speech input tube. Thus, an input impedance of approximately 60.000 ohms would be necessary on the secondary of the *patch* output transformer with an impedance of 600 ohms on the primary. Matching the receiver output was a simple matter since we use an HRO-7 and the phone output jack was a good takeoff point for a quick disconnect. The output of the receiver phone jack necessitated a transformer input impedance of 5000 ohms and a secondary impedance of 500 ohms into the *patch*. A third transformer was decided upon for isolation purposes and is designated as *T2* in the schematic. It has 500 ohm primary and secondary windings. This can be left out of the circuit with no ill effects.

Our concern over r.f. and audio feedback was the deciding factor in whether a switching arrangement should be used or a "Simplex" circuit using no switching. The switch was used, consisting of two wafers, 3 pole, 3 positions. No feedback has been experienced as all circuits not in use are out of the circuit.

Three circuits are provided, (1) telephone to *patch* to speech amplifier, (2) receiver to *patch* to telephone, and (3) normally used microphone to *patch* to speech amplifier. This arrangement allows us to monitor the receiver output with the telephone; the telephone output to the transmitter, as well as modulate the transmitter with the telephone microphone. It is necessary to control the output of the telephone line to the speech amplifier to prevent overmodulation, hence a "T" pad was used instead of having to ride the gain control of the speech amplifier. The nice thing about a pad attenuator is that it attenuates without upsetting the matching of impedances. It is important that the three circuits be isolated from d.c. voltages with a good grade of paper capacitors. The input circuit from the telephone uses two chokes bypassed to ground with good 200 $\mu\mu$f mica capacitors. This will keep out any stray r.f. that might start the proverbial cat-chase-

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[1] "GE Ham News," Sept.-Oct., 1949, Vol. 4, No. 5, p. 1.

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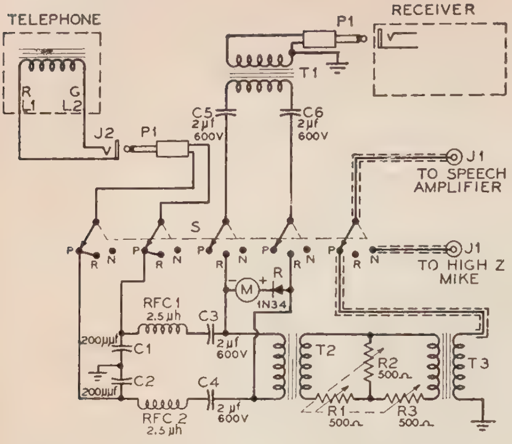
640 Snowhill Blvd., Springfield 32, Ohio



In this circuit the meter is used to monitor gain from the receiver to prevent crosstalk in the phone lines (hold to 3.0 mw level).

C1, C2—200 μμf 600 v Aerovox 1469.
C3, C4, C5, C6—2 μf 600 v paper Aerovox UC 600.
J1—Microphone receptacles, Amphenol PC1M.
J2—Phone jack, Carter #1.
RFC1, RFC2—R-F choke, 2.5 mh, National R-100,
M—Meter 0-200 μa. Simpson 127 2".
R1—Plugs PL-55, ter #2.
R—Rectifier, Sylv IN-34.
R1, R2, R3—500 c T-pad, Mallory 500.
S—Switch—Two wa 3 pole, 3 pos.
T1—Transformer 50C 10000:500 ohms
T2—Transformer 500: ohms.
T3—Transformer 5C 50000/100000 oh

tail effect. The precaution was taken to shield all wires from the secondary of transformer *T3* to the speech amplifier since a high input impedance circuit is used. If your transmitter is low input impedance, i.e., 5, 200, 500 ohms, be sure you get transformer *T3* with a secondary to accommodate the correct impedance.

Some means should exist for tapping into the telephone line. But first of all, get permission from your local commercial telephone office for they are not always agreeable to tapping into the lines. If permission is forthcoming, open up the base and look for the terminals marked *L1* and *L2* or the terminals that have the red and green wires attached. Two insulated wires brought out to an insulated open circuit jack will give you an easy tapping point.

Three interconnecting cords are then necessary, (1) telephone to *patch*, about 3 feet long terminating in PL-55 plugs, (2) receiver to *patch*, also about 3 feet long terminating in PL-55 plugs, and (3) a shielded line 5 feet long, terminating at each end with Amphenol microphone plugs to connect the *patch* to the speech amplifier. The microphone normally used (dynamic here) can be connected to the *patch* and left there.

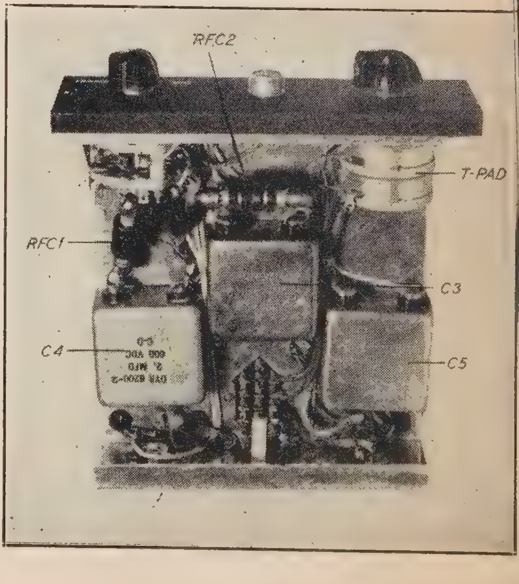
The front view of the *patch* shows the general layout of controls. The meter located in the center of the panel is used to give a visual indication of the receiver output level into the telephone line. It consists of a 200 micro-ampere meter utilizing an IN-34 crystal to rectify the receiver output into the telephone line. With the use of a bit of common sense, this meter can be omitted from the circuit as long as the receiver output is held down to three (3) milliwatts or less. This is approximately the level of normal telephone conversation. Failure to hold down to this level will cause troublesome crosstalk in adjacent telephone lines in the cable bri ing both the neighbors and the telephone man your door.

Another feature of the *patch* is that you can c the telephone and get the party without the d tone or contact noise and ensuing preparatory c versation being transmitted over the air. Expl its operation to those who may use it and cauti them that they are on the air and many others m be listening to their conversation. (That lesson w learned the hard way here and we never fail caution any and all, regardless.)

We are now ready to test the *patch*, switch transmit and tell the party to go ahead. If y have a word to add, both sides can hear the comme since you, too, can use the telephone transmitter modulate the rig. When you are ready to recei switch to receive and keep a firm hand on t receiver gain control for you can monitor the outp thru the telephone receiver. The first *patch* attempt here was with a station on Okinawa where a "G wanted to talk to his mother and was successful completed to the pleasure of all concerned. T

(Continued on page 6

Bottom view of the phone patch.



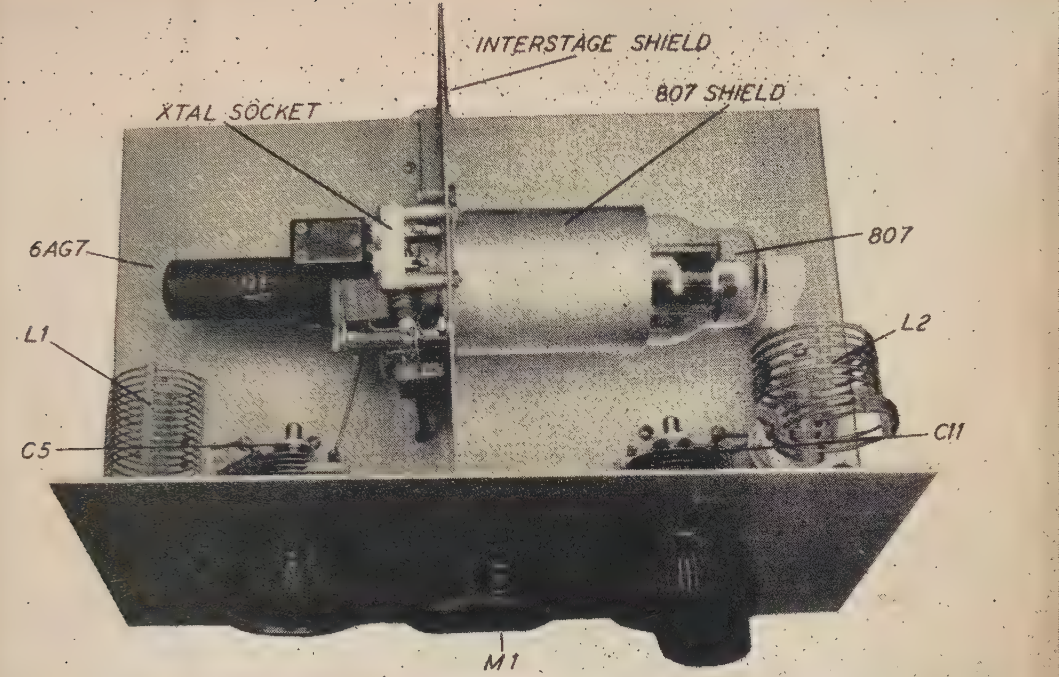


Fig. 1. Top view showing partition between the two stages. This arrangement permits very short leads.

A Foolproof 11-80 Novice Transmitter

MERRITT KIRCHHOFF, W2FAR* and DAVID D. BULKLEY, W2QUJ**

A very great problem in designing a suitable Novice transmitter is making it work on at least two bands. Stability on 11 meters is just as desirable as stability on 80 meters. Our two authors have designed such a transmitter—stable, foolproof and bug-free. Operating straight through on 80 and doubling in both stages for 11 meters it will not self-oscillate or produce unwanted parasitics—Editor.

YOU HAVE STUDIED THE CODE, studied theory, and have finally taken the FCC examination for your Novice class license. After what has seemed an interminable wait the letter arrives from "Washington". Anxiously it is opened. The day has finally arrived!! You are a ham! An officially licensed Novice ham with those distinctive "WN" call letters. Now—the big question is: "How do you get on the air?"

The radio receiver industry has provided us with fine amateur communication receivers, many of which are quite reasonably priced. Although construction of a simple receiver is quite possible and very interesting, most Novices, no doubt, will purchase their receiver rather than build it. The transmitter, however, is a different story. Practically every American ham prefers to build most of his transmitting equipment himself.

The limitations placed on your class of license (crystal-control with a power input of seventy-five watts) leaves little but to choose the most efficient and workable transmitter circuit you can find.

The Novice will find little lacking in the transmitter to be described. It uses a versatile 6AG7 harmonic crystal oscillator which drives a highly efficient 807 r-f amplifier circuit. You may expect to obtain an excellent 50-watt telegraph signal within your frequency bands of 3700 to 3750 kc and 26960 to 27200 kc. The transmitter operates as a straight crystal oscillator/amplifier on 3700 kc while

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*76 Myrtle Blvd., Larchmont, N. Y.
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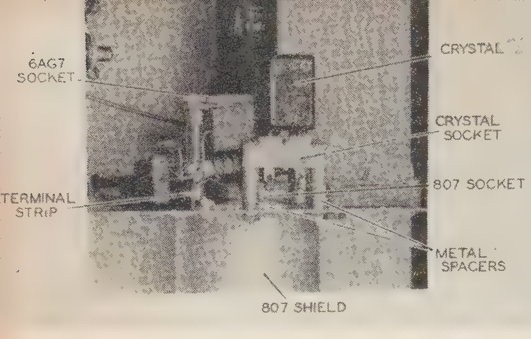


◆

Fig. 2. The tube sockets are mounted back-to-back. On the 6AG7 the pins with numbers 1 and 8 are at the bottom nearest the chassis. The filament pins on the 807 are also located in this position.

◆

26960 to 27200 kc is covered by doubling in the crystal oscillator and operating the 807 amplifier as a doubler.

If those of our newcomer hams will follow the photographs and text carefully, no trouble should be experienced in "getting on the air."

General

One of the first considerations in planning any transmitter is the layout of the stages on the chassis. This is important from the standpoint of convenience in operating the equipment as well as in minimizing interaction between the stages. Although many modern vacuum tubes permit phenomenal power gain they present somewhat of a problem of unwanted feed-back and spurious oscillations (called "parasitics"). However, if the crystal oscillator and the amplifier are mounted as shown in *Fig. 1,* there will be absolutely no evidence of these annoying vagrant oscillations.

Referring to *Fig. 1,* the various parts mounted on the chassis are easily identified with the part numbers as given in the circuit diagram and in the parts list. Although certain commercial parts are indicated in the parts list, it should be stressed that any comparable part made by a different manufacturer may be substituted. Any reputable amateur supply house will gladly help the Novice to choose the parts he needs.

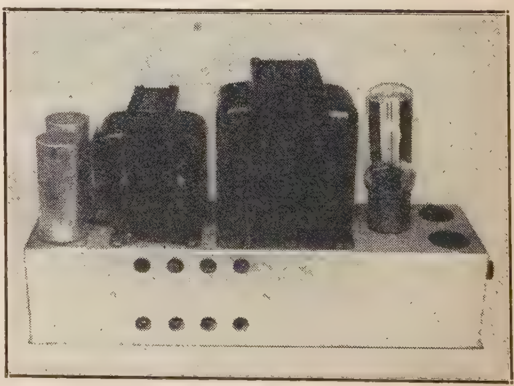
Following procurement of the necessary parts, i.e. resistors, condensers, chassis, knobs, etc., the next step is to lay out the 11 x 7 x 2 inch chassis and drill the required holes. Although an aluminum chassis is desirable, as it is easy to drill and to work, a steel equivalent may be used; using a steel chassis merely requires a bit more "elbow grease" than the aluminum variety.

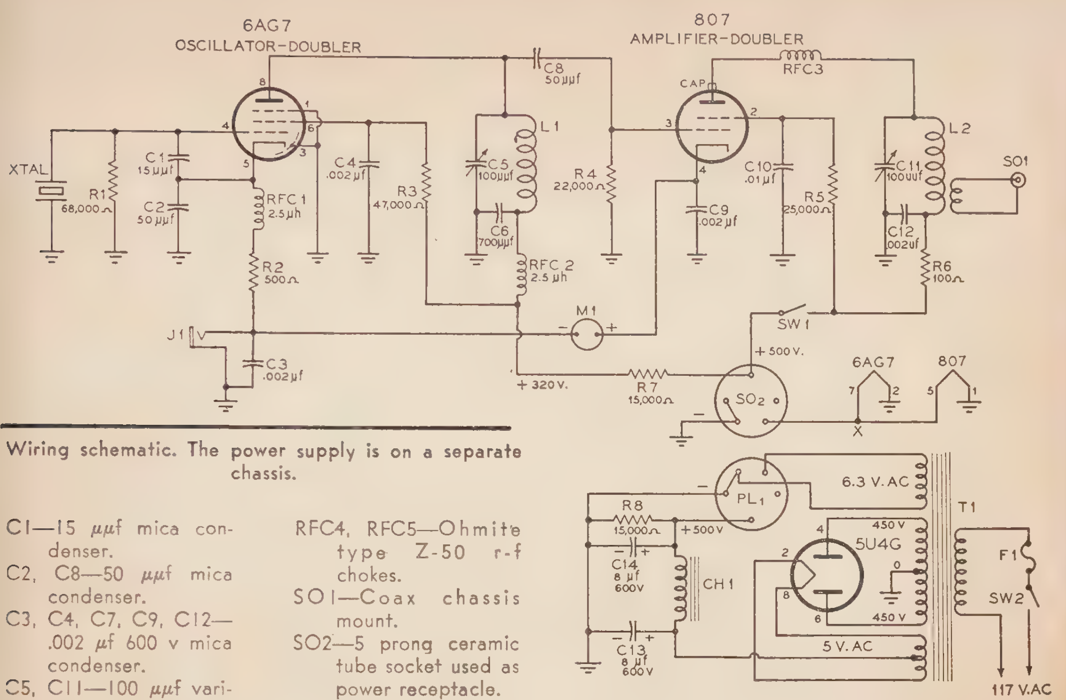
The only large holes that must be cut are those for the meter, in the front panel, and for the 807 socket, in the vertical shield. With the mounting arrangement shown in the photograph, we are able to keep our tube wiring connections extremely short, thereby eliminating any "bugs" in the transmitter from the very start. *Figure 2* shows the simple means of mounting the 807 tube socket in the shield with the filament pins toward the chassis. The 6AG7 is mounted adjacent to it on 1½ inch metal bushings with pin numbers 1 and 8 toward the chassis. In cutting the meter hole it is advisable to use a circle cutter, adjusting the cutter blade approximately 1/32-inch larger, on the radius, than the radius of the meter body. If a circle cutter is not available, small holes may be drilled every 1/8 inch or so around the circumference of a scribed outline of the desired hole, and a cold chisel used to cut through the metal separating the small drilled holes. When the piece of metal is removed from the center of the holes the edges may be filed smooth to remove the burrs and projecting pieces of metal. The 807 socket hole may be cut in the same manner as the meter hole or a standard socket punch may be used.

A five-prong tube socket is mounted on the rear of the chassis for power supply connections. Standard five-prong connectors are readily available or a power plug may be made from the base of a discarded five-prong tube. This convenient means of power connection eliminates the possibility of a short-circuit in a terminal strip or of contact with the high voltage terminal when the power supply is on.

The shield separating the two stages of the transmitter may be a 5½ x 7-inch Bud interstage shield or may be made from a sheet of aluminum or steel with a ½ to ⅝-inch lip bent on the bottom edge to allow securing it to the chassis. The authors used the latter in constructing the transmitter. Although a metal shield separates the crystal oscillator from the r-f amplifier, the magnetic fields of the coils L_1 and L_2, as seen in *Fig. 1* might possibly react on one another; therefore, they should be mounted

Fig. 2. The power supply is built on a separate chassis. Reading from left to right are the filter condensers, the choke, the power transformer and the 5U4G tube.





Wiring schematic. The power supply is on a separate chassis.

C1—15 μμf mica condenser.
C2, C8—50 μμf mica condenser.
C3, C4, C7, C9, C12—.002 μf 600 v mica condenser.
C5, C11—100 μμf variable condenser. (Hammarlund Type MC100-S or equivalent).
C6—700 μμf 600 v mica condenser.
C10—.01 μf 600 v mica condenser.
C13, C14—8 μf 600 v electrolytic (Cornell-Dubilier Type KR708).
C15, C16, C17, C18—.001 μf mica.
R1—68,000 ohms, ½ w
R2—500 ohms, 1 w
R3—47,000 ohms, 1 w
R4—22,000 ohms, 1 w
R5—25,000 ohms, 10 w wirewound
R6—100 ohms, 2 w
R7—15,000 ohms, 10 w wirewound
R8—15,000 ohms, 25 w wirewound
RFC1, RFC2—2.5 mh r-f choke.
RFC3—2 T #24 enam. on 1 meg. 1 w resistor.
RFC4, RFC5—Ohmite type Z-50 r-f chokes.
SO1—Coax chassis mount.
SO2—5 prong ceramic tube socket used as power receptacle.
SW1—High voltage wafer switch (Mallory, Type 161C).
SW2—Toggle switch SPST (Cutler Hammer Type 8280-K14).
PL1—5 prong power plug (May be made from base of old 5-prong tube).
M1—0-150 milliameter (Triplett Type 327T, 0-150 ma).
T1—Power transformer, primary 117 v a.c., secondary 450-0-450 v, 200 ma. 5 v @ 3 amp, 6.3 v @ 5 amp. (Thordarson Type T22R35).
CH1—Filter choke, 8 h @ 150 ma. (Thordarson Type T20C-54).
F1—Type 3 AG fuse and holder, 5 amp.
J1—Open circuit jack (Mallory Type 701).

at the extreme ends of the chassis to prevent any possible interference and undesirable feedback. Should feedback occur, the 807 would oscillate by itself and very likely would cause interference outside the band assigned to Novice licensees.

Keying is accomplished in the cathode circuits of the crystal oscillator and the 807 r-f amplifier. The keying jack is mounted in the lower left of the front panel.

Condensers C_5 and C_{11} are mounted directly on the chassis next to their respective coils. This feature prevents possible shock when tuning the transmitter for the condenser shafts are at ground potential. The five-prong coil sockets are conveniently mounted on metal bushings, eliminating the necessity of cutting extra holes in the chassis.

Wiring the small components into place should be done with a very hot soldering iron using as little solder as possible. Excessive solder frequently seeps away, forming a path to ground which frequently is difficult to locate. Careful placement of the various resistors and condensers to allow the shortest lead-lengths possible will prevent any trouble arising from parasitic circuits.

COIL SPECIFICATIONS

80 Meter Operation

L_1—80 meter 25 w plug-in coil, no link (Barker & Williamson, Type 80 M).
L_2—80 meter 75 w plug-in coil with adjustable end link (Bud, Type OES-80).

11 Meter Operation

L_1—20 meter 25 w plug-in coil, no link (Barker & Williamson, Type 20 M).
L_2—10 meter 75 w plug-in coil with adjustable link (Bud, Type OES-10) (One turn removed or shorted).

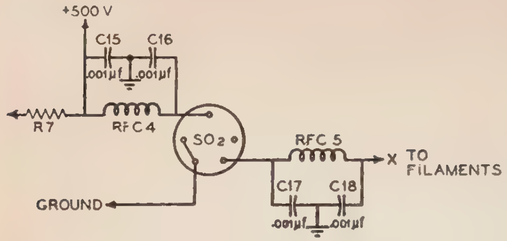


Fig. 4. In some areas additional harmonic suppressi will be necessary when operating on 11 meters. The power filters should be built into the transmitter place of the usual circuit.

When the transmitter is completed, every connection should be carefully checked for errors and for possible poorly-made solder joints.

We can now proceed to the power supply which is considerably less difficult to build. The various components are mounted on a 4 x 12 x 3 inch chassis as shown in *Fig. 3*. In wiring we must once again be careful with the soldering of all components, for if one connection is made incorrectly it might easily result in a burned-out power transformer or other power supply component. Make certain that the correct polarity of the electrolytic condensers is observed; minus always goes to ground.

Now we are ready to test the operation of our transmitter. The power plug may now be connected to the transmitter. The 807 amplifier should always be tuned or tested with a 40 watt incandescent light bulb connected to L_2 as a dummy antenna to prevent damage to the tube while the amplifier is out of resonance.

80 Meter Tuning Procedure

We now place the correct 80 meter crystal oscillator coil, L_1 and the 80 meter amplifier coil, L_2, in their respective sockets and an 80 meter crystal in the crystal socket. It is suggested that only good quality crystals be used to make certain that the frequency is exactly as stated on the holder. Surplu crystals are excellent buys but frequently are unreliable.

The filament switch S_1 may be closed. With th tubes alight the plate voltage switch S_2 may b turned on, applying high voltage to the tubes. S_3 which controls the plate voltage to the 807 r- amplifier *should be in the "off" position.*

The crystal oscillator plate tuning condenser, C_5 should be set at approximately 1/3 of full capacity. Now, touching a ½-watt neon bulb to the "hot" end of the coil L_1 (the end opposite to the grounded end), C_5 should be tuned for maximum neon bulb brilliance as the telegraph key is pressed. We then proceed to the 807 amplifier. First close switch S_3 to apply plate voltage to the tube. Then, with the telegraph key again depressed, C_{11} should be tuned to what is referred to as a "dip"; that is, when the plate current meter reading is at a *minimum.* The transmitter is now operating properly and is correctly tuned.

We may now connect an antenna to the pick-up loop of L_2. The key is depressed and the meter is watched carefully as we again tune C_{11} to a minimum plate current reading. This is necessary, for connection of the antenna unbalances the plate circuit of the 807. With the antenna connected, it will be found that the "dip" will be less pronounced than with the dummy antenna. Therefore, care should be exercised in correctly tuning to the "dip".

Plate tuning of the 807 should be done quickly, for when the 807 is out of resonance, the tube draws excessive current which may damage it if allowed to continue. With a plate voltage of approximately

(Continued on page 65)

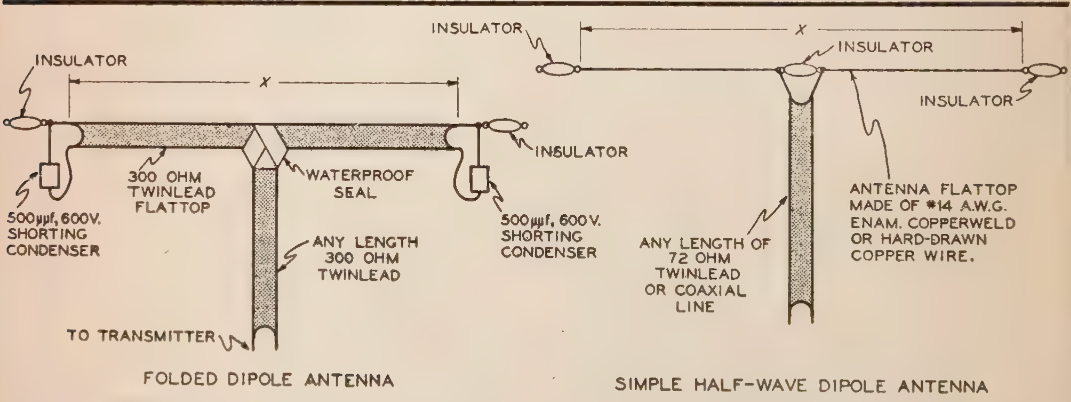

INSULATOR
X
INSULATOR
300 OHM TWINLEAD FLATTOP
WATERPROOF SEAL
INSULATOR
500µµf, 600V. SHORTING CONDENSER
ANY LENGTH 300 OHM TWINLEAD
500µµf, 600V. SHORTING CONDENSER
TO TRANSMITTER
FOLDED DIPOLE ANTENNA
INSULATOR
X
INSULATOR
INSULATOR
ANTENNA FLATTOP MADE OF #14 A.W.G. ENAM. COPPERWELD OR HARD-DRAWN COPPER WIRE.
ANY LENGTH OF 72 OHM TWINLEAD OR COAXIAL LINE
SIMPLE HALF-WAVE DIPOLE ANTENNA

Fig. 5. In constructing the folded dipole, one conductor of the 300-ohm Twinlead is cut at the center. A feedline of 300-ohm Twinlead is attached at this break. The connection is soldered. The condensers are not required at 11 meters. On that band the two ends are soldered without the condenser. On 80 meters the antenna should be about 126 feet long. On 11 meters it should be 17 feet and 4 inches.

BCI and the BCL

C. TIERNEY*

THIS ALL STARTED the day I sat down at my radio and heard the amateur who had just moved in down the block. I turned the dial frantically, and he was all over the broadcast band. He was saying something about QSO, QRT, QRZ, CQ and XYL—I think he was transmitting in code.

It was very nice listening to him talking, but I wanted to hear "Piedmont of the Murder Squad" which came on in an hour. It was my favorite program and I never missed it. So I went to see the amateur to tell him he was interfering with my radio reception.

He opened the door when I rang, and put on a very sad look when I told him I heard him on my radio.

"I went to a lot of trouble to make sure I wouldn't have BCI," he said. "I shielded my whole transmitter."

"I don't know about this BCI stuff," I said. "But when you transmit you get inside my radio and do something so that I can't hear anything but you, and I don't like it that way. I want you to stay off the air so I can hear 'Piedmont of the Murder Squad' when it comes on in an hour."

"I've got a schedule in an hour to handle some traffic to Japan," the amateur said. "What kind of a set have you got?"

"It's a midget set. I bought it through an ad in the paper. It's guaranteed to work; and it works swell when you're not on."

"Maybe I can fix your set so that my transmissions won't bother it," the ham said. "But right now I'm eating supper."

"Well, I want to hear "Piedmont of the Murder Squad," I said, "so you either stay off when he's on or fix it so I don't hear you."

He then sort of half sighed, and yelled in to his wife, "Put my dinner in the oven and keep it warm for me, dear, while I fix a case of BCI."

His wife mumbled something. She sounded like she was used to putting his supper in the oven and keeping it warm.

"I'll have to get somebody to work my transmitter while I fix your receiver," he said, and picked up the phone and dialed.

In a moment, he said into the phone, "Hello, Bob. I got a case of BCI. . . Oh, I didn't know you were eating. . . This guy wants it fixed by seven and you know we got our sked with Japan at that time. . . No, the BCL is here now, waiting." (He thought I missed that.) "Okay," the amateur went on, "you come over and I'll have the wife heat up something for us later after we've had our sked."

He hung up and turned to me. "He'll be here in a few minutes." Then he went into a back room and returned with a soldering iron in one hand and some things he called resistors and coils and condensers in the other.

His friend came to work his transmitter. He was an amateur—he looked sad too.

As we were walking to my house, I nodded at the resistors and condensers, and said, "What are you going to do with those things?"

"It depends on how I'm getting into your set," he said. "I might have to put a condenser in the first audio stage."

"Oh, no you don't!" I said. "I just bought that set. I don't want you tearing it apart."

". . . . don't think I won't, I know my rights."

He stopped walking, and said patiently, "Now, look here, I'm going to a lot of trouble because of your radio. I don't have to fix it if I don't want to. I checked with my neighbors and they said I didn't interfere with their receivers, so it's most likely your receiver that's at fault. I'm only fixing it for you because I want to keep peace in the neighborhood."

"I just bought this set," I said. "It's your transmitter that's causing the trouble."

"Let's take a look at this radio of yours," he said.

We went into my house, and I led him upstairs to my bedroom to my set. "You're going to have

(Continued on page 69)

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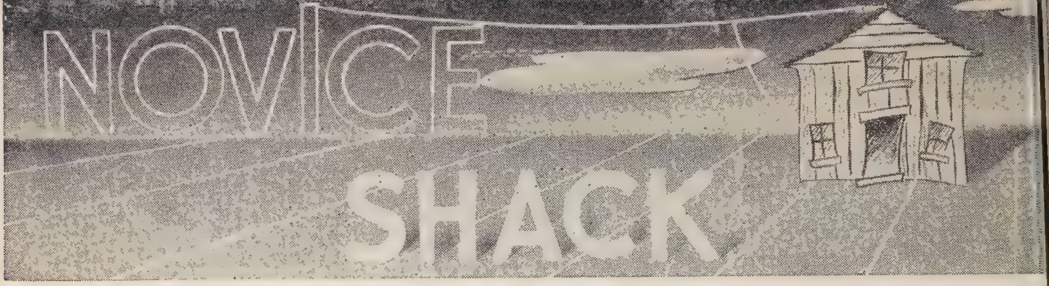
*P. O. Box 59, Alameda, Calif.



Conducted by HERB BRIER, W9EGQ*

The untimely death of Carl Drumm, W2GJV, prevented him from carrying out his intention of devoting his second column in the "Novice Shack" to a discussion of communication receivers. I have been elected to follow in his footsteps and how I think Carl would have carried out such a column is rendered below—I hope you find it interesting and valuable when you think of a ham communications receiver.

For the purpose of the discussion, receivers may be loosely divided into commercially-manufactured, home-built, and converted "war surplus" superheterodynes; and home-built regenerative and superregenerative receivers, all sub-divided by their band or frequency coverage.

High-frequency (HF) communications receivers usually tune between approximately 1,500 kc and 30,000 to 40,000 kc. In addition, many of them cover the standard 550 to 1,600 kc broadcast band, and some cover the 50 to 54 mc or 6 meter amateur band as well. Very high frequency (VHF) receivers usually start at about 27 mc and may tune as high as 300 mc. The wide frequency ranges involved are divided into bands, chosen by changing coils, either with a multi-position switch or with plug-in units.

As the three bands open to the novice operator extend from the HF to VHF bands, and as all novice operators I know are working for their General Class licenses—so they can operate on other bands, they want a receiver to cover as wide a frequency range as possible. If the paper route is paying off, the natural way to get a good communications receiver is to buy it. Practically all commercial ones are superheterodynes; so let's study the block diagram (*Fig. 1*) and see how they work.

The Superhets

The desired signal is transferred from the antenna to the first tuned circuit, which helps discriminate against other signals. After being amplified in t radio-frequency (r-f) amplifier, used in all but t cheapest receivers, it goes through another tun circuit to the mixer tube. There it is further a plified and mixed with a signal from the high-fr quency oscillator, producing a signal at the mix tube plate, whose frequency is the difference betwee the two circuits, usually 456 kc. This intermedia frequency (i-f) signal goes through more tuned ci cuits and tubes in the i-f amplifier for further sele tivity and amplification.

From the i-f amplifier, the signal goes to the se ond detector, where the modulation on it is "detected or removed and sent through the audio amplifie to the loud speaker or phones.

"Wait a minute," I hear you object, "c.w. or cod signals do not have any modulation on them. Ho are you going to detect something that isn't there Answer me that." A shrewd question which high lights the function of the Beat Frequency Oscilla tor (b.f.o.) coupled to the second detector. It i tuned approximately 1,000 cycles from the interme diate frequency which enables it to beat with th c.w. signal. The resulting audio beat note goes through the audio system in the normal manner.

Usually the second detector circuit also generates Automatic Volume Control (AVC) voltage, used in phone work to vary the amplification of the r-f and i-f stages in inverse proportion to the strength of the received signals, thereby decreasing the effects of fading (QSB). It also actuates the S meter to give visual indication of signal strengths.

It is in the i-f amplifier that practically all the selectivity and much of the amplification of h-f receivers is obtained. The better communications receivers, therefore, use many tuned circuits, plus a quartz-crystal filter to obtain the high selectivity desirable for working in the crowded amateur bands. In addition, in a few receivers (Collins 75A Series, Hallicrafters S-76, etc.) the output may go through a second mixer oscillator and lower-frequency i-f amplifier (dual conversion) before reaching the second detector to obtain this extra selectivity.

If you are wondering just how much selectivity is obtained by these methods, a comparison may help The bandwidth—another way of expressing selectiv ity—of a standard AM broadcast receiver runs be tween 15 and 20 kc, and may be considerably great er. A communications receiver, with a good crysta filter set for maximum selectivity, will often have a bandwidth of less than 100 cycles for reading c.w. and 3 to 4 kc for phone work. Naturally, the greater the degree of selectivity the more signals you

Our New Novice Editor

To a sizable number of old-timers the name and call of Herb Brier, W9EGQ, needs little or no introduction. Herb received his license in 1931 and actually met his first ham months later. Not a man for using one band, Herb has operated everything from $1\frac{1}{4}$ through to the 160 meter band. SCM. RM, OO, ORS, EC, WAS, WAC are a few tokens of his past activity. A 35 w.p.m. endorsement graces the shack wall.

In re-establishing the "Novice Shack" we feel sure you will find Herb just the man for this particular job. —Editor.

**385 Johnson St., Gary, Ind.*

will be able to separate and hear clearly in the very crowded novice and ham bands.

For selectivity to be usable, the receiver must be highly stable. To a large extent, the high-frequency oscillator determines stability, because any variation in its frequency produces a similar variation in the intermediate frequency signal. Great pains are taken to make it impervious to vibration and bumps, and to variations in temperature, humidity, voltage, the setting of the various receiver controls, and even the strength of the received signal.

If you have ever tuned a so-called "All Wave" broadcast receiver on which an entire amateur band occupied only a dial division or two, you know how difficult it was to tune. High selectivity makes it doubly imperative that the frequency to which a communications receiver is tuned can be changed gradually. Bandspread, whereby the amateur bands are spread over a large percentage of the dial, combined with a smoothly-operating dial with a high venier ratio, solves the problem nicely.

For a number of reasons, it becomes very difficult to build a receiver equally efficient and stable over the entire HF or VHF range and make it available at a reasonable cost. Rather than using another complete receiver to tune the frequencies covered inefficiently (or not all), a converter is often employed. It generally consists of an r-f amplifier, mixer, and oscillator, built into a small cabinet, where it converts frequencies within its range to one within the range of its companion receiver.

Using a converter should not be thought of as an inefficient expedient. On the contrary, they can be designed for maximum efficiency and make fine dual-conversion receivers of receivers on frequencies that otherwise could not be received at all.

One thing more before we start thumbing the catalogues. All commercial communication receivers contain a noise limiter at the input of the audio amplifier. They are fairly effective against automobile ignition interference, but less so against other types of noise.

The average amateur catalogue lists twenty or more HF communication receivers, manufactured by such companies as *Collins, Hallicrafters, Hammerlund, National,* and *RME,* etc., costing from about $50.00 to as high as $1,000.00. All these companies have been in business for twenty years or more; so we know their products are reliable; otherwise they would have long since gone out of business. This assurance makes our task easier, because we know whatever one we choose we will get our money's worth.

George Harrold of Haddon Heights, N. J., one of the newcomers to our hobby with the call WN2BLV.

If we were interested in only the 3,700 to 3,750 kc novice band, and receiver sensitivity was the only criterion, probably the lowest-price models would represent the best value, because they are more than adequate for receiving almost any signal when used with even a moderately good antenna. Unfortunately, their selectivity is relatively poor, and their sensitivity and stability drop off quite rapidly on the higher frequencies. In spite of their low selectivity, they do a pretty fair job on code reception, because the inherent selectivity of the human ear allows it to pick out one signal from a maze of others.

With each increase in the price range, more desirable features appear in the receivers. Many amateurs feel, however, that those in the present day $200.00 price range represent the best compromise between price and value. Their performance too begins to drop off above about 25 mc; so it is quite common to see receivers in this price range used with

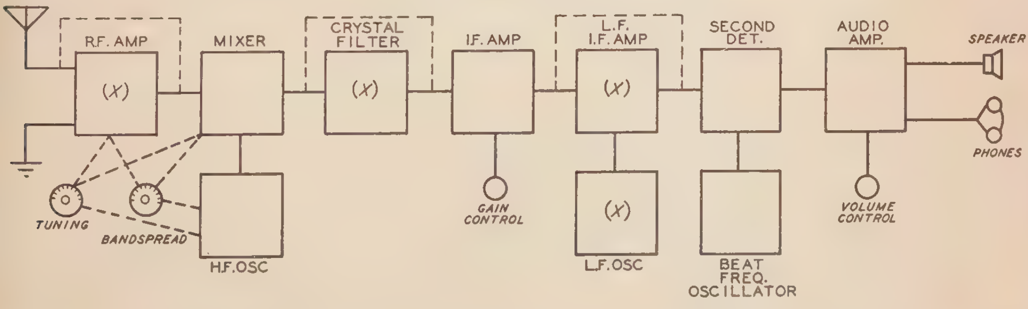


Fig. 1. Block diagram of communications superheterodyne. Sections marked "X" may be omitted in some receivers. See text for details.

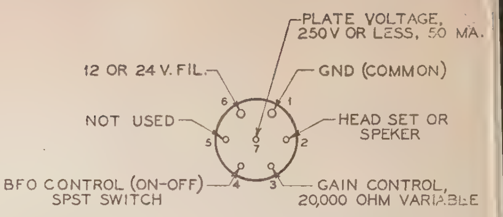


PLATE VOLTAGE, 250V OR LESS, 50 MA.
12 OR 24 V. FIL.
GND (COMMON)
6
1
NOT USED
HEAD SET OR SPEKER
5
7
2
BFO CONTROL (ON-OFF) SPST SWITCH
4
3
GAIN CONTROL, 20,000 OHM VARIABLE

Fig. 2. Connections to power plug on back of BC-454 receiver, looking from back of receiver. One side of filament voltage source, B-neg., one speaker or head phone terminal, and one side of the b.f.o. "on-off" switch and gain control all connect to pin #1 (common). Remaining connections as indicated in the sketch. More details in text.

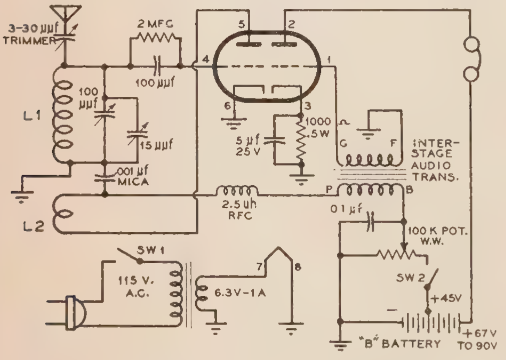
a converter above this frequency, even though the receiver itself will tune to above 30 mc.

In each price range, the decision as to which model to choose is mostly a matter of personal preference. One may have a feature lacking in another, but the second will probably have a different one lacking in the first. Or, if one model seems to have all the features of the others in its price range, plus several more, it is possible that they were obtained through a compromise design whereby many things are done fairly well, whereas in the others, a few things were done excellently.

UHF Receivers

Contrasting with the large number of HF receivers to choose from, there are only a few commercial receivers for the amateur VHF bands. One of them is the *National* HFS, which covers from 27 to 250 mc by means of six plug-in coils. Its selectivity is not particularly high (not always a handicap in a general-coverage receiver for these frequencies), but it is also designed to be used as a converter in conjunction with any receiver capable of being tuned to 10.7 mc. Complete with external power supply, it sells for about $165.00. Another is the *Eldico* 144-150 mc receiver available as a kit for about $60.00 and wired for about $100.00. A third is the *Sonar* SR-9, 144-148 mc receiver for about $73.00, both plus accessories. Both of these were designed primarily for Civilian Defense work as well as for the novice band.

Converters are used very extensively on two meters. One of the most popular of these is the *RME VHF-152A*, which covers 26.9 to 29.8, 49.5 to 54.2, and 143.8 to 148.2 mc, converting them to seven mc. It sells, complete with built-in power supply, for approximately $100.00. Another commercially available one is the *Gonset* 144 to 148 mc converter, with 1,00 kc output. It is designed to be powered from it companion receiver and costs about $45.00. Lik other *Gonset* converters for the lower frequencies it is designed for mobile work, primarily, but work well with other receivers.



L1, L2 WOUND ON 1" DIA. FORMS.
80 METERS – L1 – 25 T. #22 TO #28 ENAM. WIRE CLOSE WOUND.
L2 – 4 T. ¼" BELOW L1. CLOSE WOUND.
40 METERS – L1 – 10 T. CLOSE WOUND.
L2 – 2 T. CLOSE WOUND.

SW1–SW2 SPDT SO THAT WHEN POWER IS REMOVED FROM PRIMARY OF TRANS., LEAD TO REGEN. CONTROL IS BROKEN TO PREVENT .5 MA. DRAIN ON BATTERY.

War Surplus

The surplus markets are just about stripped bar of communication war receivers, but there are tw or three models worth discussing, because they ar still available from amateurs who purchased them some time ago and no longer use them. Signal Corps Receivers BC-348's, BC-224's and BC-312's, all of which tune from 1,500 to 18,000 kc, have been converted for 110-volt a.c. operation and are regularly advertised in the classified ads of *CQ* and *QST* for between $50.00 and $75.00. And they are a lot of receiver for that price, especially for c.w. work. Another one is the BC-454 "Command Set" receiver. It tunes from 3,000 to 6,000 kc, and makes an excellent 80-meter receiver. There are still a very few available on the surplus market, and many amateurs, who bought one or more for less than $5.00, have them stored away. If you can locate one, they are simple to convert to 110-volt a.c. operation. *Figure 2* shows the connections necessary to the socket on the rear. With a 24-volt, 1 ampere transformer, the conversion can be completed without looking inside the receiver (but who could resist at least one peek) by following the data in the schematic and mounting the gain control and phone jack on the power-supply chassis.

Alternatively, the filaments may be wired in parallel instead of series-parallel and operated from a 12-volt transformer, and the control and phone jack mounted on the front of the receiver by removing the small aluminum box in front of the coil assembly. *Pins two* and *seven* are the filament terminals on all tubes, except the 12SR7, where they are *seven* and *eight.*

Building Your Own

Home-built receivers have become somewhat of a rarity among amateurs, because of the availability of so many excellent commercial models, and a mistaken idea that building one is a fearfully complicated business. Actually, they can be as simple or as

(Continued on page 60)

Fig. 3. Diagram of simplest receiver. It will perform well enough to be useful for actual two-way radio contacts. An a.c. operated power supply, furnishing up to about 200 volts may be substituted for the B battery; however, in normal operation the battery's life will be sufficient for many, many hours of operation. If the supply is used, connect the terminal of the regeneration control now connected to the 45-volt battery terminal to B-plus through a 33,000 ohm, 1 watt resistor.

DX AND OVERSEAS NEWS

HERB BECKER, W6QD*

BEGINNING A NEW YEAR often makes us think back a few years. Starting 1952 makes me feel sort of like that, in fact, it makes me ook back quite a few years. For example, in 1933 he magazine "RADIO" published a story and desription of station W6QD-W6CUH. CUH and I had ur stations combined and for almost a year, beween the two of us, we kept the thing on the air bout 16 hours a day. You see, then, neither was narried. Well, anyway, I guess we worked our hare of stuff, DX to you. A few months later the iagazine asked us for some articles. CUH did some iighty fine technical stories, which many of you vill remember. My end of the deal was kicking hrough with a few DX notes now and then. This vas taking place in 1934. Then in the issue of Octoer 1935 the column "DX" was born. This was the rst column devoted entirely to the DX man.

A lot of signals have bounced off of the Heaviside ayer in the last 17 years and I'm just crazy enough o think a bunch of you might get a kick out of ncient DX news about old time DX men . . . or ld time DX news of ancient DX men—Take your hoice. Now I guess you had better prop, or drop, ourself into an easy chair and get fortified for rhat might prove to be flimsy reading. OK? Shall e reminisce?

All of the following will be taken out of issues of RADIO" and I'll just give the month and year. s you know, "RADIO" was purchased during the rar and moved to New York, finally evolving into ie current "CQ".

June 1935: Byron Goodman, W6CAL, won the 28 ıc contest this year. "RADIO" offered an award o the station having the first 28 mc QSO over 2000 iles. W6CAL worked W4AJY. (This was, of course, efore By got the call from the wilds of Connecticut. fter deserting us he became W1JPE, then W1DX.)

Oct. 1935: LU1EP has just had a successful QSO ith ON4AU on 28, 14, and 7 mc. (1EP is still pitching as of last week in the Contest.) W6GRL made WAC in 55 minutes. F8EX has a YL by the name of Marinette, and maybe this is why he isn't on 20 so much.

Dec. 1935: Dave Evans, W4DHZ (now W6SZY), is fussing around on 14325 kc. What's wrong? W2BJ worked an LY and an LX for countries No. 87 and 88. BJ is WAB . . . . Worked All Burroughs. W6WB is through with ham radio, so he tells everybody, but the laugh is that he has a nice dark cellar where he hides himself. He picks out a nice corner, fires up his 10 meter rig, and proceeds to pull nice fat arcs with an oversized pencil. Someone approaches and Bud turns off everything and says, "Naw, I've been outa ham radio for months". (Bud is the same today—17 years later.)

May 1936: W8ZY scored 31,700 points in this year's ARRL test. W9TJ made 25,100, W6GAL 12,000, W4DHZ 91,000 (high man), W6GRL 58,000, W1FH 66,000.

June 1936: G2PL has a gal by the name of Cleopatra. W7AMX got word from ON4AU that F8EX was getting married in a couple of weeks. We hate to see 8EX leave the air but that's the way it goes.

July 1936: W2BHW (now W8BHW) worked U9ML for his 89th country. W3AYS uses a 203A with 150 watts input and has 28 zones and 70 countries.

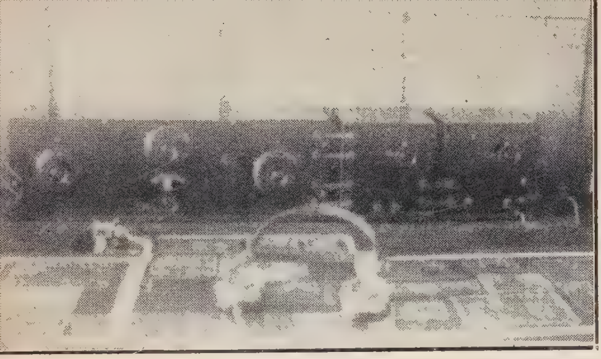
Oct. 1936: K4KD (now KP4KD) has 20 and 59 . . . uses a 203A. VK2EO moved a few miles and became VK3EO.

Nov. 1936: W7AMX worked four FB8's. G2PL has a crush on Ginger Rogers. (And today it's Jane Russell.) W6GAL worked his 100th country with a 210. W3EVW uses as low as 15 watts for his DX. (How times have changed.) W2GWE sure did his stuff in the DJDC Contest and wound up with 250,000 points.

Jan. 1937: W5EOW of Dallas cooked up a little "pome" between QSO's. (This one is good any old year.)

1406 So. Grand Avenue, Los Angeles 15, Calif.

This is W6QD today. Two final amplifiers are used, each having a pair of Eimac 4-250A's. A 310B, converted for quick band changing, is the driving unit. Receiver is an HRO-50-1 which appears to have fallen through the desk! However, very practical for ease of operation.



1921 saw "youngster" Becker building this re ing set. The usual variocoupler and variom lashup was used, the detector being one of t double filament Audiotrons while the one ste audio was a VT-1. Transmitter was a rotary s gap, condenser made from old photograph pl foil, and transmitter oil; while the aerial periodically a "T" and then an inverted "L". S was really a shack way out in back of the ho Many was the time, when I would sneak out t at 2 a.m. on school nights, my Mother would the main a.c. switch inside. That was all for night.

The DX Contest

Every morning 'bout half past four,
  I slip on my pants and sneak out the door,
Out to the shack I run like heck,
  To warm up the tubes and get a frequency check,
Listen 'bout an hour, don't hear a thing,
  Haven't worked a furriner since way last spring.
Hear a CQ, my heart gives a bound,
  Till he signs W5, just across town.
Now some folks say there ain't no hell,
  But they ain't hams, so they can't tell.
When fall rolls around I take another chance,
  And buy 66's instead of new pants,
Buy a new receiver when the old one's best,
  But I'm durn sure ready for the next contest.

Feb. 1937: A picture showing Mr. W6QD and the new Mrs. QD right after the wedding. (Imagine, fifteen years. Gosh!)

July 1937: ZL1FT surprises a lot of the boys when he tells them he has been using four 201A tubes in his rig. W2GVZ uses a 300T in his final and is up to 31 and 85. W2IOP lives within what he says is "one subway station from Times Square." His shack is on the third floor of a 20-story apartment house wired with DC. There are also four DC elevators surrounding the shack. Larry says he doesn't have the worst location in the city, and has worked 33 zones. He uses a Q antenna.

Nov. 1937: W6TT worked HS1BJ on phone. F8EX said during a QSO "After off the air for two years, am back on with new rig, new QRA, and new baby." You see, he was married a couple of years ago.

Jan. 1938: W2GVZ worked his first J on what he calls a "rainy, lousy, foggy afternoon." W8LEC hooked HS1BJ for his 38th zone. W9WCE says "down with high power" and is in favor of working DX on 40 meters. W5KC is in the Honor Roll with 30 and 81. W2BMX has his fingers on a 'mike' so presume he will soon be on phone.

March 1938: W6MVQ is now eligible for the Honor Roll with 30 zones. W7AMX admits he has a perfectly good double-button carbon 'mike' of 1920 vintage.

May 1938: W2UK scored 176,000 points in the ARRL Contest. W1HKK sends in a list of phone DX and says he hopes it meets with the approval of a c.w. man.

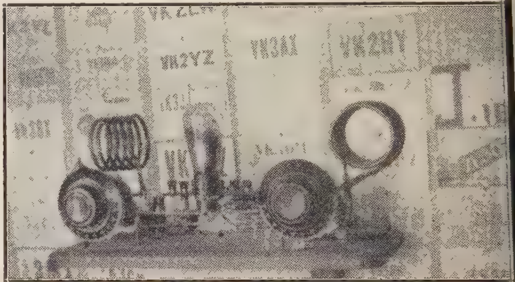
January 1939: W7DL is again knocking them off and is still using the same 150T's. W8CRA (now W3CRA, and by the way, where is he?) is now a poppa.

March 1939: W6BAX had a swell chat with ON4AU who told him he had "worked K7FST with his pajamas on." (How novel)

April 1939: VE4RO is happy these days after hooking CR7AG for his 39th zone. W6HJT is going to Stanford and has gotten himself engaged.

May 1939: VE5RV clipped out a classified from a Vancouver, B.C. newspaper which rea "Young woman wishes to learn amateur wire operating from party with Ham set in order obtain amateur ticket. State terms. Box 27, Provinc Now if any of you have any terms, it is in y hands!

June 1939: My operative discovered that W6H isn't going to get married this month, because has been married since last December. So, he s his equipment and they lived happily ever after.



One of the first c.w. rigs at W6QD was the old TPT with a 210. When the glass insulators inside the 2 would crack, I knew the tube was too hot.

November 1939: We are very glad to hear tha W2IOP hasn't fallen by the wayside. Larry has YL by the name of Pricilla, and she just *love* Ham radio. She sends all of Larry's QSL's and understand they bring as many as three cards i return. IOP says she is R99 plus, and my guess i that when they start talking about R99 YL's w are just about seeing the end of a good DX mar (Twelve years later; I know Larry is right abou the R99 business, but I was wrong about losing good DX man) Larry closes his letter with: "Wome and QSL's—they are both provoking." A letter re ceived from HS1BJ informs us that on June 24t the Government changed the name of the countr from Siam to Thailand.

April 1940: W6OEG is actually getting built u for this year's Contest. He has never quite mad it in time before, and the only thing he needs no is an alarm clock that won't awaken him. (Almos twelve years later Bill is still getting built up. H does have an alarm clock that doesn't ring, however!

July 1940: AC4YN has been coming through onc in a while, and to date there have been five W6 who have worked him. They are: W6GRL, W6NL W6OEG, W6VB, and (of all things) W6QD. Th crystal controlled job, no less, 47, 46, and a 210, er replaced with a "high power jug" . . . a 242-A.

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ctober World Wide DX Contest was cancelled ie to a June order from the FCC banning amateur dio communication with foreign stations.

October 1940: DX Column heading was changed to ad "X-DX".

November 1940: Bill Eitel, W6UF and Jack cCullough, W6CHE ride to work every day on eir bikes.

April 1941: W6KW works KC4USB at Little nerica for first 75 meter phone hookup. (X-DX adually running dry on account of no foreign ws.)

October 1941: X-DX discontinued and was remed in "CQ" after the war.

e War's Over—Here We Go Again

April 1946: W2IOP becomes managing Editor of Q" and W6QD starts up the DX column again. Remember, much of the DX then consisted of the I's scattered around in the occupied areas and gning portable.)

February 1947: W6GRL is giving everyone 'China' he is over there signing XU6GRL.

June 1947: WAZ Honor Roll gets going again. ay Honor Roll was headed by W6VFR, this month 2GWE leads off. Separate QTH list, for your nvenience, initiated and will be at end of column.

July 1947: Isle of Man becomes country with GD efix.

September 1947: W2BXA, No. 1 postwar WAZ nounced, and W6VFR is No. 2.

December 1947: ZS2X, first overseas WAZ anunced.

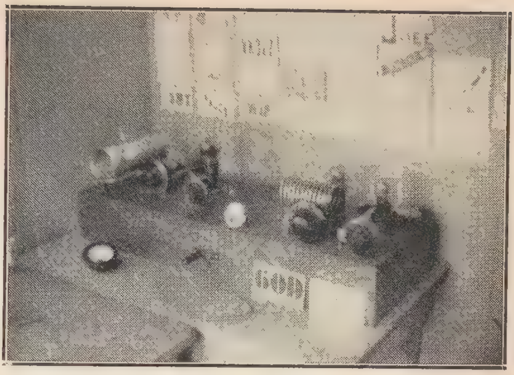
January, 1948: The 1948 DX Marathon begins.

March 1948: W6DI leads the phone boys in the onor Roll followed by W4CYU and W1HKK. AZ certificate No. 16 is issued to W6WKU.

April 1948: G2PL first British WAZ.

June 1948: W6ENV receives WAZ certificate No. . The battle of the "zeros" is on, with WO's KO, NTA, NUC, and GKS participating.

August 1948: WAZ certificate No. 49 issued to 2IOP. W6DI still leads the phone boys, with 6VFR second, and W4CYU third. C8YR is giving lot of the boys Zone 23. FE8AB is giving the boys new country now, the same as he did when he s FQ3AT.



October 1948: First "CQ" World Wide DX Contest gets under way.

November 1948: W2IOP, Managing Editor, congratulates W6QD on making WAZ No. 65. (Ahem!)

October 1949: Larry LeKashman leaves "CQ" and W6QD expresses regrets. (I took it all back later.) The 2nd "CQ" World Wide DX Contest takes off on the last weekend of this month.

This, more or less, brings us up to fairly recent times, so there's no point in digging out the current stuff.

Now that we have lifted a few of the high-spots from "DX" in the past issues of "RADIO" and "CQ", and you have had a glimpse of the past rigs of W6QD, I would like to say a couple of words.

This is the last DX column your DX Editor is going to churn out for you. It is not the easiest thing in the world to sign off after being in the saddle for quite a number of years, especially when I think of the hundreds and hundreds of friends I have throughout the world, and from whom I have been hearing regularly. This part I am going to miss a great deal.

Now then, without going into too much detail, I think I should tell you the main reason for calling it a day. The DX business has really turned into more than a part-time endeavor. Year after year it has grown in the amount of work to be done. It has gotten to such a place that I don't feel justice is being done to the column, and this, naturally, affects all of you guys. As you probably know, I am a Sales Engineer representing a number of radio

QD in 1933. After an 852 rig this little ten-foot breadboard blossomed forth. This compact semi-portable built by W6CUH, my old sidekick, and yours truly. We wanted to see if that discarded water-cooled tube would work on frequencies higher than the BC band. It did!

Next came the "Corn-Fed KW" to W6QD using 250TL's. As you see, the saw and hammer was still being used. The other final amplifier utilized 750TL's, both finals able to handle a kw. Receiver, NC-101X. The VFO was an XEC.

equipment and parts factories out here. This type of work is requiring a large amount of traveling, and now that W6ENV is with me, he is in the same boat! For a year I've tried to find a way to do both jobs but it wasn't in the cards, thus my decision to resign.

My successor will be Dick Spenceley, KV4AA. He certainly needs no introduction to you. I feel we have one of the best men possible for DX Editor. Dick has the time to do a good job, he is geographically well located, and is one of the most active on the air.

Perry Ferrell, our Managing Editor, has suggested that I keep our DX Committee, which now includes KV4AA, intact to continue the checking of WAZ cards, decide country problems, and handle our World Wide DX Contest. In view of this, anything pertaining to the above should be sent to me in Los Angeles.

Dick will devote his time to writing the DX column which will include answering all correspondence pertaining to it, as well as handling the Honor Roll additions and changes. All DX news and Honor Roll changes should be sent to:

Dick Spencely, KV4AA
Box 403
St. Thomas
Virgin Islands

In winding up this epistle, let me say again, I have sincerely appreciated the cooperation you have given me. After seeing the same handwriting, or other identifying things, in your letters for years, this business gets rather personal. The friendships I have gained through DX over the years are invaluable, and when any of you boys have a spare moment—drop me a line. I'll always be glad to hear from you. Then, too, there is always the chance that I'll get on the air, and who knows, we may establish "wireless communication". To the DX Committee members, W6ENV, W6DI, W6GAL, and W6SA, as well as my two gals in the office, I want to say "Thanks". Without their cooperation I could not have carried on.

Well, I'll get down from my well-worn soap box, but first, please give Dick Spenceley, KV4AA, the same kind of cooperation you have given me. Remember, it's you fellows that make the column. I think you should know something about this guy, Spencely, so here's the low-down. Dick was born in West Newton, Mass., is married and they have three boys and one girl. He went to the Virgin Islands with the where he served as Radioman at "NBB" until charged in 1928. His first call was NP4TC in after which, in 1927, he was issued K4AAN and this call until 1941. Dick returned to the ai January, 1947 with his present call, KV4AA. occupation is (you guess), the radio business. is Secy-Treasurer of the St. Thomas Power Autho and is Deputy Director of Civil Defense Commun tions.

Well, there's your new DX Editor. Guess I'll along now and look for a W9 . . . and of course, see you on the low end. 73.

Dick, it's all yours. Good luck.

Thanks for those kind words Herb. It's going be a tough job keeping the column up to standa set at W6QD. The gang will be glad to know, h ever, that you and the DX committee will conti in an advisory capacity.

Sincere congratulations are extended to our o WAZ for this month.

273 **W3CPV** John M. Ries, Jr. 40 234

Without further ado here are a few words on November contest. This 'jam session' which agitat the ether was during a period of fair to p conditions. As a result, it is probable that t 300,000 point level attained by top scorers in t more lenient past will be nicked considerably. T will not reflect any lack of effort by our participa who were in there slugging every inch of the wa Ten meters proved disappointing to Europeans w reported hearing very few Ws, however, a few CR LUs, ZLs, VKs and KH6s skidded through wh conditions relented. Twenty seemed best, highlight by continuous activity throughout with bright sp being furnished by many consistent signals such CR5AD, OQ5RA, VK9XK, OX3GD, CX1FB, ZS2 VQ4DO, XZ2EM, ZL1MB, VQ2AB, 4X4RE a PY2CK. Forty lagged with Europeans not up their usual level in W-land while Eighty helped few with KH6MG, ZL1HM and ZL1CI booming i South America was ably represented by YV5B CE6AB, LU6AX and HC2KB (QRS); while ZL 1ADX, 1MQ, 2FA, 3OA, 4FO and VKs 2PV, 2T 2GW, 2AXN, 3CX, 3AZW 4QL and 5BY provide plenty of zip from down under. All in all a gran time was had and good sportsmanship noted through out.

WE SEE THAT—

W2AIS grabbed ZL1CI 3513 and ZL1HM 350 in the contest . . . Old Ivan of FE8AB fam is now in business again at FF8AG. The same goe for ZD4AB. Both new locations appear in QT column. . . . ZD6DO showed up for the contest at VQ4DO using VQ4ERRs' rig pending arrival of his own. Pi will be located permanently i VQ4 now. . . . W3QT (K6FAL) called us th other day from JA2AY but ND. JA is a real toug one here, Chas. better continue on to VK. . . Of late we get lots of silence from FH8AB, he i definitely not on Wallis according to Felix FK8AC Our guess is that he was FD8AB all the time, sam 2330Z and 14023 ?? . . . Both FD8AA an 8AB have been putting Togoland on the map recently, see QTHs. . . . It was sure tough whe 4W1AC signed off for good in our collective faces guess there must have been 500 QRXing at the time Al complains about rough W methods—well natch!

– see QTHs. . . . W2CTO nabbed VS8AK 730Z 14068 T9, any dope about this one? Bob did swell job engineering QSOs for CP5EK I hope Hans will resume soon. . . . VP8AUs ten watter as been handing out South Georgia right and left 400Z 14008, great stuff Jock! (see OTHs) . . . . Rumors connect ZL1HY with a trip to Union Island hich could be ZM7, what about it Dave? . . . . /K1BS returns to VK land in April and we hope he QSLs will start rolling. . . . It seems we can cratch W0ELAs projected VS5 activities for the resent, Clyde couldn't hang around Hong Kong ong enough to become a British citizen—tough on ll of us OM.

According to Fung VS6CG, XU6F is presently aying low. . . . ZC2AA made a short appearance 220Z 14045 T9 recently making a few VKs happy. fforts are now being made to get him on again, he s connected with Civil Aviation on Cocos. . . . /P1NW/2 appeared briefly on Grenada (Windvards), but is now back in VP1. Redoubled activity s expected from VP2AF (Leewards) (QTHs) in ntigua. Austin is old VP2KS. . . . FY7YC as been showing 1045Z 14070. . . . FB8BB suffers from high noise level due to d.c. generator. This id not deter W6TS, W6HUA, W9HUZ, W8HFE, V8NBK, W2NSZ, VE7YC or W8JIN from grabbing im but it took KV4AA 30 minutes to pry a S3 utta him. . . . An interesting letter from "J nd JB Japanese amateur radio ops" advises there re over a thousand of them itching to get on. We ope it will be soon OMs! . . . A note from V1RAN quoting ZB1CH states that Malta will be ependably represented by ZB1AJX, other ZB1s are ulling out. . . . ZL2RP writes he has now eturned to ZL after a two and a half year stay at R2BC, any missing QSLs will be taken care of pon request. W2WC laments 7 mc cdx during conest—me too Frank, it looks like any change will e for the better. . . . W6MX snagged IT1AQS.

W0TKX comes up with 4X4RE, VU2NB, IS1CNQ, P8AP, VQ4CM, ZD1AN, VP2AF, FD8AA and thers, all on twenty, nice going Bob. . . . /2BXS/KJ6, now awaiting a regular KH6 call dvises that QSLs with printed KJ6 QTH will soon e forthcoming from the printer and will be mailed ut shortly. Jack thinks you will like new prints ather than having the KJ6 penned in on an old /2BXS QSL—we agree and tks OM. . . . /6ZY states that A. E. Lower, pre-war XU4XA, hungking, is now Stateside, All his old QSLs, ogs, etc. were lost and he would appreciate any relacements on QSLs. Send c/o USN Communication tation, Dixon, Cal. . . . W5FXN reaches 141 ith EA9AP, SV0AB, CT2BO, FR7ZA, VP5BH, U1AD and others, not satisfied, Jim then grabbed VP7 on six!! . . . W6BIL sends a letter from 3EIZ who is compiling a UA call book showing all, town and zone. So far he has over 400 UA/UR THs. You can help by forwarding him same data om your UA QSLs as this booklet would be a andy item. . . . At the time this appears it ill be ancient history, but we hope the VQ4RF/ /5HBM/VQ3PBD expedition to Zanzibar, VQ1, has ewarded most of you with a QSO. Present dope om W3RAN and others advise the three above entioned ops will run 100 watts, using all bands mc thru 3.5 mc phone and c.w. Their stay was pproximately ten days commencing Nov. 24th, or, other reports state, Dec. 3rd. . . . KL7PI dvises a ship will call at Amsterdam Island in Demember, we trust this will result in freeing flocks of QSLs from FB8ZZ. Joe also says JA0IJ is OK and QSLs—also anyone wanting AP4A watch low end 14. . . . W2NSZ nabbed FD8AB 14024 0100Z. . . . Morgan Goodwin, Genl Delivery, Uleta, Fla. intends to clean up the FY7YB QSL situation and will have all logs from this station. Send all requests with self addressed, stamped envelope to FY7YB at the above address. . . . W7HXG latched on to ZM6AK, VK1BS, VK9XK, VK9BI, VP5BF, HB1JJ/HE, VP4CQ, ZK1BC, FK8AD, KG4AO, take it easy Lee!! . . . W9HUZ reports YI3ECU 1320Z 14095, he QSLs too.

W4KE wrapped up TI2PZ, KH6AGU, ZL1CE, ZL4JA, KB6AK/KH6, F3AT/FF, HR1DF, MD2DW, 4X4DK, ST2GL, YU1AG and others, Well that shouldn't be so difficult Lloyd with the signal you put in here. . . . W0HX hasn't been on too much, but reports phone QSOs with FO8AB, FG7XA, KC4AB, ZM6AA and ZS7C. Yep Lew, Zones 18 and 19 look tough the way the Russkies are acting. . . . W6UHA comes through with a long list of new ones which include FB8BB, VK1BS and FR7ZA, atta girl Maxine. . . . W1HE and the five watter has been pulling in S9 reports from W7OY and W6AM besides contacts with FQ8AC, HB9JG, CN8FB and others. You don't need that beam Wally. . . . Ole Burt, W6EHV, has now rec'd the KW rig and will proceed to make KG4AF a household word. He is starting on his third DXCC. The contest gave W9ESQ assorted ZLs, VP8AI and VK9XK. . . . W6LGD snuck up on HZ1AR, FB8BB and 9S4AX for three more. . . . W1MCW phoned CT3AV, EA9AR and UP5A. . . . ZL3CP clicked with KG4AQ, MD5PM, SV1SP and KS4AQ but says you can scratch C9AA. . . . We hear from W6EPZ after a too long silence. Epsie is up to 196 with FB8BB, onward to 200. . . . Latest from W5KUJ puts him up to 166 with morsels like YI3BZL, 3A2AG, 9S4AL and others. . . . W0DU reports 13 new ones since 5/13. Ray's total is way up there, 212 now. . . . GM3EST is gunning for Zone 23. Keep at it OM.

Another certificate may be in the making, requirements? Just QSO 15 members of the West Gulf DX Club. Yup, Bob that might make your W5s real popular. . . . Cliff, ZL1MQ reports ZK2AA back in biz on Niue; Pat, VR5GA is back in ZL for good; VR5PL no rig at present; ZM6AA should be back in ZL by now. . . . W6AM reports that W6AVM now lives near W3JTC in Md. and should be on soon. . . . W6EFM knocked off LZ1RF, ZD6DU and FB8BB, this raises John to 206. . . . Another John, W4HA gets up to 169 with GC8MF, GD2FRV and VP5BF. . . . . W8BHW nabbed FD8AA and FB8BB; me too on FB8XX, Lindy. . . . W9WCE adds FG7XA and ZD1SW 142 now 37z. . . . W2HMJ got EA0AB, PX1AR and 3A2AD, one more for 200 Gus. . . . W5ASG nipped FD8AA, 3A2AG, FB8BB and OY3IGO. . . . W3JKO sends us 16 new ones. We will get this WAZ and Honor Roll straightened out very shortly Bob, but turnover difficulties may preclude the publishing of the Honor Roll this issue. All should be up to date and clear sailing with the February issue.

A last minute QSO with W0ELA, now Stateside, reveals a harrowing trip covering nearly 25,000 miles replete with frustrations, delays, aircraft breakdowns and last minute flight deviations which diabolically ganged up to prevent his appearing on the air at VK5 land last October. These difficulties, which would

(Continued on page 58)

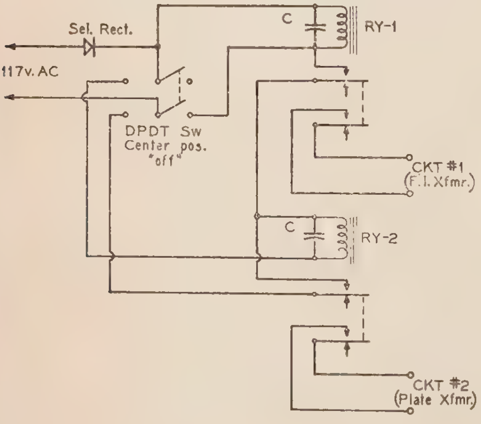
Inside the SHACK AND WORKSHO

> *Your S & W Editor still needs more good ideas for this column. Don't let your nifty stunts go to waste. Rough sketches of circuits are satisfactory, and if you have photos of the idea—send them along. Each idea is worth $2.50 in cash—or a year's subscription to CQ. All S & W contributions should be addressed to Shack & Workshop Editor, c/o CQ Magazine, 67 West 44th Street, New York 18, N. Y.*

A Simple, Single Switch Sequence Control

The circuit shown in the accompanying figure represents a solution to the "filaments on first—filaments off last" problem. While other circuits may not require relays, more than one switch is mandatory for successful operation of the circuit. However, with this circuit individual control of two circuits is accomplished with only one DPDT switch.

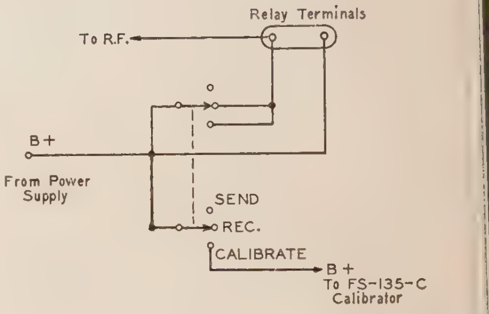
The operation of the unit is simple. When the switch is thrown to the right, *RY-1* is actuated and circuit *#1* is "on." When the switch is then thrown to the left, *RY-1* is held closed by the charge on *C* across the relay winding. The length of time *RY-1* remains closed after the switch is thrown to the left will depend upon the resistance of the relay winding, and the value of *C*. *RY-2* is actuated when the switch is thrown to the left, and *RY-1* is held locked up through one set of contacts on *RY-2*. The value of *C* across the winding of *RY-2* should be sufficient to prevent chattering of the relay, a value of 0.2 μf to 0.5 μf worked satisfactorily with 10,000 ohm relays. The value of *C* across the winding of *RY-1*, however, should be in the neighborhood of 40 μf to permit the switch to be thrown from right to left withc releasing *RY-1*.



In no way can circuit *#2* be turned "on" befc circuit *#1*. The switch must be a DPDT toggl switch with a center position "off" feature.

Interested readers will find the unit particularl applicable in a transformer where filament vol ages should be applied before plate voltage is a plied. A surplus three position toggle switch ar surplus 10,000 ohm, 115 volt d.c. relays kept tl cost of the complete unit to a minimum, and tl filaments on-first-off last feature made the co struction of the unit worthwhile.

Jack D. Gallagher, W5HZB, ex-W0AR



Installing the FS-135-C Calibrator

Although the installation process described below is particularly designed for the HQ-129-X receiver it is undoubtedly adaptable to other models of communication receivers. My primary purpose was to install the secondary frequency standard inside the receiver cabinet and be able to turn it off and on from the receiver panel.

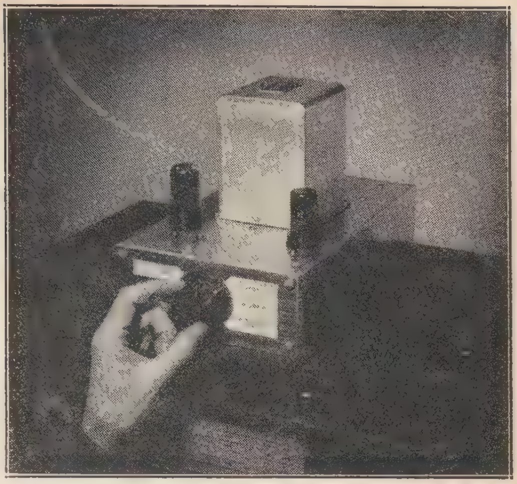
HQ-129-X users will find it best to mount the unit at the rear of the chassis near the VR-105 regulator tube and the i.f. output transformer. It is only necessary to drill two small holes in order to mount the standard with self-tapping metal screws. A larger hole can then be drilled and fitted with a rubber grommet to pass the power leads through the chassis wall. The "Send-Rec" switch (S6) is then removed and discarded. Substitute a small two deck three position wafer switch. When the proper connections are wired to the switch it will continue to perform its original function, but with the added position of "Calibrate" (frequency standard power on). The original appearance of the front panel is unchanged and the extra time consumed in making this simple installation will be amply repaid.

H. Paul Bohlander, W3VVS

The Modified Single-Sider

RICHARD E. LONG, W3ASW*

No pretending on our part — this is strictly specialized and just for the SSB group. To them, we hope they will find this modification by W3ASW, both interesting and useful. —Editor



The Single-Sider before modification.

FROM TIME TO TIME numerous requests have been received by the writer for information concerning his modification of the Single-Sider.[1] Inasmuch as all operation at this station is ia single sideband, there are certain changes in the riginal design which will make this unit especially uited to SSB reception. This article describes hose changes thought to be justified—and a brief lescription of the 16 to 18 kc band-pass filter we re using.

evised Circuit Description

The i.f. signal is picked off the second detector nd applied to the mixer tube in the Single-Sider. These signals mix with an oscillator signal at the ntermediate frequency of the receiver, plus or ninus 18 kc. An 18 kc band-pass filter inserted n the plate circuit of the mixer selects the desired ide-band and feeds it to a ring modulator. The ilter is designed to have a high input impedance pproaching a match to the mixer plate and a low utput impedance matching the varistor ring moduator. The output of a separate oscillator at approximately 18 kc is fed to the ring modulator vhere it is mixed with the one sideband to produce n intelligible SSB signal. The output of the ring nodulator is fed to a 600 ohm repeater coil which ffords a match to the ring and offers a simple means of eliminating both the upper sideband product of the mixing action, and any 18 kc residual signal which might leak past the ring. At this point, you will have a low level audio signal and you may use any audio system that appeals to the operator. At W3ASW, one stage of a.f. is included in the modified Signal-Sider and this output is fed back to the normal audio system of the HRO receiver.

A new tuning system for the mixing oscillator is arranged as shown in *Fig. 1.* This provides a means of adjusting the fine tuning for correction within those last 20 cycles, as well as a means of switching from one sideband to the other. Capacitors *C* and *C2* are air padders of the proper value to tune the upper and lower conversion frequencies. *C1* is a one plate padder similar to the correction type tuning capacitor in the BC-221 frequency meter. Otherwise, the mixing oscillator is the same as that shown by Bane in the original unit. The writer's experiences clearly indicate that the inclusion of this fine tuning adjustment is well worth the additional trouble.

Figure 2 shows the band-pass filter that was made, and is in use at W3ASW. It is a two section filter designated "Type I" in Terman's Tables of Pi Section Band-Pass Filters.[2] The impedance was chosen at 1,000 ohms, in order to provide values of inductance and capacity that were more readily obtainable. The values of inductance and capacity were calculated from the formula in Terman's Handbook and the resonant frequencies were found in the Federal Handbook.[3]

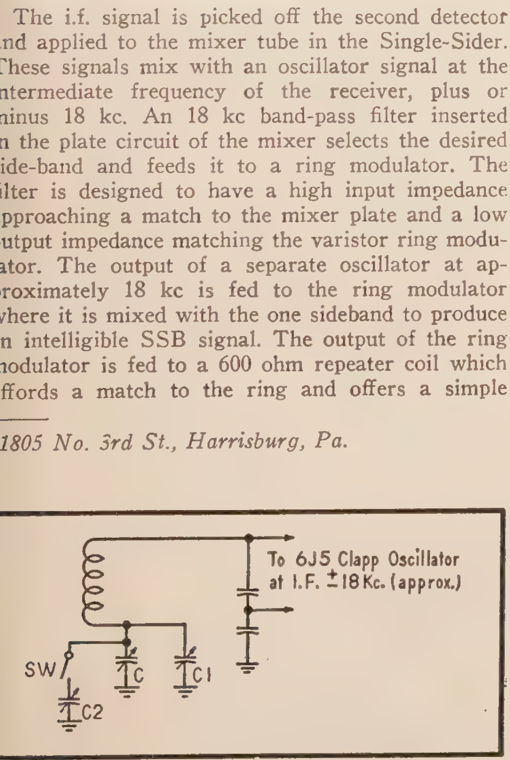


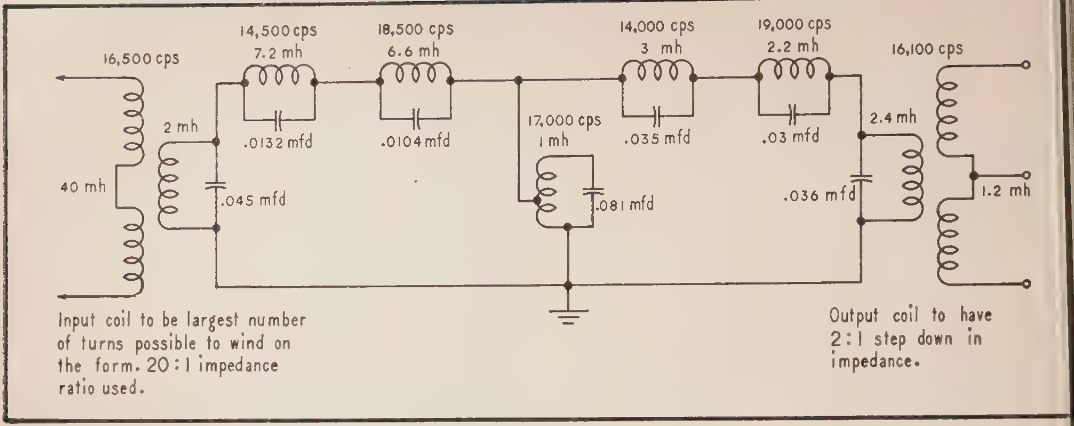
Fig. 1. The mixing oscillator is modified for very fine tuning.

1805 No. 3rd St., Harrisburg, Pa.

[1] "The Single-Sider", Bane, CQ, page 13, May, 1949.

[2] Radio Engineers Handbook, F. E. Terman, 1st Edition, Sec. 3, Par. 28.

[3] Reference Data For Radio Engineers, 2nd Edition p. 62.



Input coil to be largest number of turns possible to wind on the form. 20:1 impedance ratio used.

Output coil to have 2:1 step down in impedance.

Fig. 2. Schematic of the two-section Type I filter in use at W3ASW. This particular filter is not a prerequisite in modifying the original Single-Sider—the National filter will work just as well.

In building this filter, it is important to adhere to the given figures as closely as possible—and as mentioned by Terman, it is of prime importance to have the individual circuits resonate at the calculated frequency. If you must depart from the calculated value of either inductance or capacity, be sure to make up the difference in the other value, until the exact resonant frequency is obtained. This "fudging" of L and C is the key to the whole problem. It is best to get the capacitors in mica and as close as possible to the indicated value. Then vary the number of turns in the coils to reach proper resonance. The coil forms we used were salvaged from surplus telephone loading coils. These forms originally bore two 88 millihenry windings. Their Q was checked at the operating frequency and found to be approximately 55. The choice of the 16 to 18 kc frequency range* was made so that the filter could be tuned up with a conventional audio oscillator covering the standard 20 to 20,000 cycle band.

The input coil of the filter may be a stumbling block, since it must have enough inductance to offer a load to the plate of the mixer tube. The writer used larger toroidal cores than those specified by W0MNN. If you use smaller cores, it is necessary to make the input winding of very fine wire and experiment with shunt feed systems in place of the series feed system shown here.

The carrier re-insertion oscillator, (*Fig. 3*), incorporates a tertiary winding. This was added to provide better coupling to the ring modulator. This will give a much higher value of carrier voltage than the coupling system used by Berry and the exalted carrier principle of reception is more easily obtained. Carrier injection to the ring is approximately 10 volts.

The Varistor

The Varistor can be almost anything with the approximate overall impedance that will match the filter output—bearing in mind that if a change is made in the filter and the varistor—you may have to change the repeater coil. A 2:1 mismatch can be tolerated. A Western Electric Varistor D-98914 was used. Other similar varistor models can be utilized with only slight modification, such as; the Model D-167020, which is used in surplus Instrument Landing Receivers (BC-733 and R-98/ARN-5). IN34s, IN21s, etc., have never been tried in this circuit. They should work providing the mismatch is not too great.

The repeater coil is a Western Electric surplus item No. D-168839. Any 1:1 coil with the proper impedance and a reasonably close center tap will suffice. The capacity across the secondary is used to bypass all upper side band products of the mixing, and whatever residual carrier may leak through. Values as high as .25 μf may be used without detrimental effects to the speech quality.

Final Adjustments

In tuning up the Single-Sider you can follow W0MNN's system of tuning a filter, although I did not find the extreme accuracy of the BC-221 necessary. Simply remember to use a 1,000 ohm resistor on each circuit as you tune it to resonance. Use an audio oscillator having the nearest output tap to 1,000 ohms. The calibration of the audio oscillator is not important.

It will be noted that all values of tuning capacities in both oscillators are approximate. This is necessary since the final tuneup is the governing factor of these values. Starting at the first oscillator, use a BC-221 as a detector and determine just where the upper and lower frequencies of this oscillator fall. Adjust the tuning condensers of the first oscillator to resonate at the i-f frequency plus or minus 18 kc (approximately). Only a slight amount of trimming will be necessary and that may be done with the noise in the earphone. It's that easy!

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*Before building this type of band-pass filter it would be profitable to read the article by Berry, W0MNN, in QST for June, 1949. The method of arriving at the final value of L and C for the center coil of the filter is a direct steal from this article. A value of 1 mh of inductance should be maintained between the tap and the ground on the center coil of the filter. This permits a wide choice of capacity values. Any differences can then be made up as indicated in the article by Berry. Actually, the filter described by Berry will work very nicely in the Single-Sider, and two such receiving adapters have been built and are operating at W1GR and W1HRC. The filter input and output terminals are obviously interchanged for use in this adapter. If a Single-Sider has been constructed using a National filter, or any other filter, there is no need to change the filter in order to adapt it to SSB reception as described in this article.

When the coil for the carrier reinsertion oscillator is wound, remember the total number of turns on the primary and use about one quarter of that number for the tertiary winding. Tap the tertiary winding every 20 turns. Use about 1/5 or 1/6 of the number of turns on the primary winding for the secondary winding. Tapping may be a good idea on this winding, but it is not done here. For the variable capacity across the primary, use a .002 μf mica compression type. This oscillator should be set at exactly 18 kc (on the slope of the filter curve). If you use the W0MNN or the National filter, make the adjustment about 20 db down on the steep side of the filter curve. The actual process takes about two minutes and resembles the BC receiver method of setting up the tracking of a hf oscillator. After this is done, go back to the first oscillator and touch up the two adjustments to center the noise peak with the fine tuning capacitor *C*.

In the initial test of the carrier re-insertion oscillator measure the output with the tertiary winding connected in the ring circuit. Set the tap for the highest possible output voltage from the tap to ground. Between 8 and 10 volts should be available.

Operation

After plugging your Modifier Single-Sider into the audio system, you are now ready to go to work on some of those garbled signals you hear on the air. At the writer's station, an accurate frequency meter and a panoramic adapter are always used. With these units as a check, a weak signal can be copied alongside the strongest AM carriers. You can see the AM signal in the adjacent channel and check his frequency; in the meantime you can listen to the SSB signal which is otherwise barely discernible; and if the AM signal is clean you will only hear an occasional spit from him. As a test tune to 3999.5 kc and if there are no AM signals centered above 3996.5 kc you will hear only a few sounds from stations near or slightly below 3996 kc—unless he splatters.

Speaking of splatter, this unit affords a good means of determining just who does splatter. Set up for the upper sideband and tune towards him slowly from the high side. Likewise, set up for the lower sideband and approach him from the low side. When you begin to hear the sputtering, check the frequency to which your receiver is tuned. Then find his carrier and check its frequency. In many cases you will be surprised. On the credit side, you will find many clean signals that apparently splattered on your regular receiver. They were just so darn strong that they only appeared to splatter and cover up a lot of space. The selectivity of the Single-Sider shows up this common receiver fault.

Provisions were not made for the use of the Modified Single-Sider on straight AM signals. If this is desired, a switching arrangement could be made that will change the demodulator from a ring to a full wave affair, and at the same time switch off the carrier re-insertion oscillator. My first experience receiving AM signals with an exalted carrier, and no means of locking in on the carrier automatically, was very poor. I have not been able to find the correct tuning adjustment to get rid of the rain barrel effect. Undoubtedly a little more experience will be the answer. If the idea of further modification does not appeal to you, connect your Single-Sider with the output being fed into the HRO ahead of the phone jack, so that the volume controls on each unit are independent. If you want AM, turn down the adapter and turn up the receiver, and vice versa. This system will give you an opportunity to compare the two systems of reception. Open both gain controls and tune in a signal; retard the regular receiver gain and the noise, hash, and heterodynes will disappear like magic. Several demonstrations of this type will also "sell" your fellow hams when they visit you. •

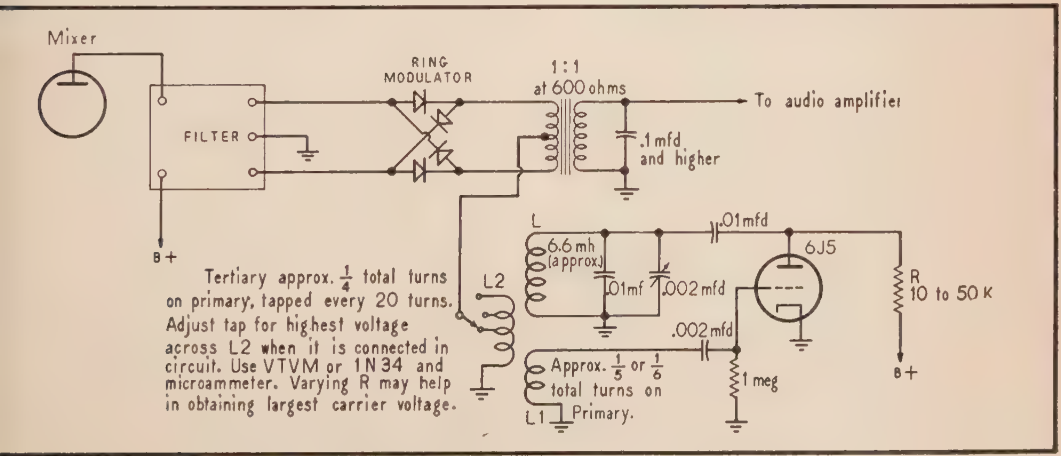
Mixer
FILTER
B+
RING MODULATOR
1:1 at 600 ohms
To audio amplifie
.1 mfd and higher
L
6.6 mh (approx.)
.01mf
.002 mfd
.01 mfd
6J5
R 10 to 50 K
B+
L2
.002 mfd
1 meg
Approx. 1/5 or 1/6 total turns on Primary.
L1
Tertiary approx. 1/4 total turns on primary, tapped every 20 turns. Adjust tap for highest voltage across L2 when it is connected in circuit. Use VTVM or 1N34 and microammeter. Varying R may help in obtaining largest carrier voltage.

Fig. 3. The varistor circuit and the carrier re-insertion oscillator.

MEN OF RADIO

WILLIAM R. WELLMAN*

To tell the truth there was considerable discussion, pro and con, on whether or not we should run this historical series. Frankly, we found it a diversion from the usual type of amateur material - one that was both interesting and informative. Read it over and see if you don't agree. If your reaction is favorable, let us know and the second of the series will appear in the March issue. —Editor

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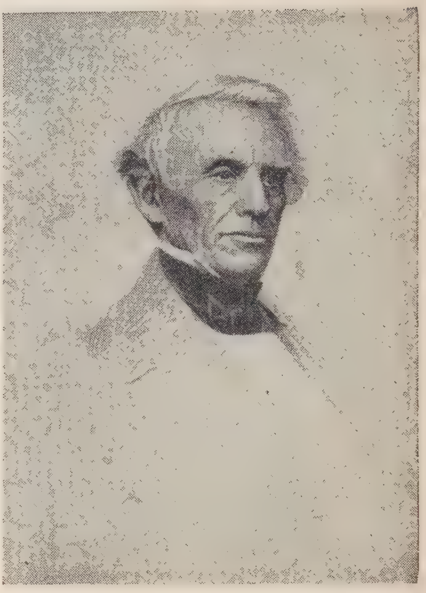
IN ANOTHER YEAR or so, radio will celebrate the completion of a phenomenal half-century of commercial application, growth and development. Perhaps no other scientific achievement, including the progress of the automotive industry, has made comparable strides in so short a space of time.

Most active members of the radio profession are far too busy to indulge in the intensive reading required to gain a fair knowledge of the history of the art, for the story is scattered over the pages of such diverse publications as encyclopedias, biographies, technical reports and newspapers. Yet the story of radio's development and the men who made it possible is truly fascinating and merits the attention of everyone having direct or indirect contact with the work.



Samuel F. B. Morse, (1791-1872)

Early Experiments in Wireless

The assumption is generally made that radio is about fifty years old, and if we accept the beginning of commercial operations as the starting point, this assumption is correct but the idea of an electrical communication system that needed no connecting wires between stations is far older. In fact, the thought goes back more than 150 years, for in 1795 one Salva, a Spanish physicist, proposed sending signals over the 120-mile water gap between Alicante, Spain and the Mediterranean island of Majorca, without the use of connecting wires between the two points. He suggested charging one shore positive and making the opposite one negative; the resulting flow of electricity through the sea was to make signaling possible. Although he never had a chance to test his idea, we know now that it is not wholly fantastic; in fact, it is one of three possible methods of effecting communication between separated points without employing metallic conductors. These three methods are: (a) conduction, using water or the earth as the conductor; (b) induction, whereby parallel coils or wires at the sending and receiving stations are linked electromagnetically; and (c) radiation. Neither the conduction nor the induction methods comprise radio as the term is understood today; the use of that word implies the radiation of energy through space. Nevertheless, both systems might be classed as "wireless" inasmuch as no metallic conductors are necessary.

Salva's theories were shown to be workable by Sommering, a Bavarian, about 1810, but no practicable application was made of the discovery. One reason for this was that Sommering, although able to clearly demonstrate the flow of current through a body of water, lacked suitable apparatus for receiving signals—the telegraph had not yet been invented. Later on, about four years before the opening of the historic Baltimore-Washington telegraph line, Steinheil, a German experimenter, applied much the same principle to a land telegraph system, using the earth as a conductor. Steinheil was one of the men who had plunged into telegraph research after Morse had shown the idea to be valuable. Although Morse, and not Steinheil, won the race and produced the first commercially usable system, Steinheil's work was perpetuated in the familiar one-wire, grounded return system in which an elevated wire is used as the outgoing circuit and the earth acts as the return. Like many such discoveries, Steinheil's work was the result of an accident. History does not tell us whether he profited from his efforts, but it is quite likely that he did not.

Contributions by Morse

Morse, who managed to keep ahead of the field in telegraph development and who was awarded the urels of inventor of the telegraph, conducted ore than one experiment in "wireless" communiation. The inventor, by the way, was a noted rtist and early photographer; he was also the ounder of an organization that later became the Iational Academy of Design. Again, in this case, line of research began as the result of an accident. Iis conception of the telegraph came in 1832 and y 1835 he had an experimental system in operation. even years later a line, probably the first to be laid nder water, had been completed between Govrnor's Island, in New York harbor, and Castle iarden, at the southern tip of Manhattan Island.)uring the initial test, only the first few words of message had been sent, when the line went comletely dead. Morse, who happened to be looking ut across the channel, witnessed the ruin of a eautiful experiment; the underwater line had beome entangled in the anchor of a vessel. As he vatched, the anchor was raised with the wire tretched across it. A sailor stepped forward, cut ne line and dropped the severed ends overboard.

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*20-09 45th St., Long Island City, N. Y.

It would be very interesting to report that Iorse's line continued to function even though cut, ut the truth is that communications were permaently disrupted. His telegraph experiments were ontinued and, as we know, were brought to a onclusion that was considered spectacular in that ay. But in the meantime, his curiosity had been roused. He was speculating upon the possibility of ispensing with wire conductors altogether when ending telegraph signals across a body of water. Vould a system continue to function when both vires were eliminated and a body of water subtituted? He determined to find out, and in a letter vritten to Congress (then considering an approriation of $30,000 to finance the Baltimore-Washngton line) he said: "I immediately devised a plan or avoiding such accidents in the future by so aranging the wires along the banks of the river s to cause the water itself to conduct the electricity cross. The experiment was deferred until I arived in Washington; and on Dec. 16, 1842 I ested my arrangement across the canal and with uccess."

A general idea of the arrangement used by Iorse will be gained from the sketch, *Fig. 1.* rom one terminal of the sending equipment a vire was run a considerable distance along the ank of the canal, upstream, where it was led into ne water. A second wire, connected to the remainng terminal of the sender, was led downstream for distance, then also placed in contact with the vater. On the opposite bank of the canal a similar rrangement prevailed, with wires attached to the pparatus terminals running for a way up and ownstream before making contact with the water. he reason for the separation of the two wires on given side of the canal was, of course, to avoid ne possibility of a short circuit which would have appened if the wires were led into the water too lose together. In this experiment, Morse conected his wires to copper plates, shown as *A, B, C* nd *D* in the drawing. He later learned that the flow of electricity through the water was proportional to the size of the plates and the distance between the plates on one side of the river. The further discovery was made that the spacing between the two plates on one side of the stream should be about three times as great as the distance across the stream.

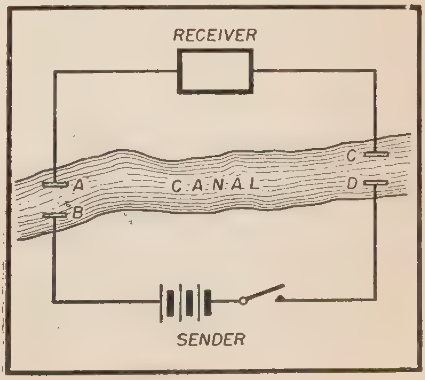
Despite Morse's successful experiments and notwithstanding the fact that he had gone a step beyond the single-wire telegraph line and had dispensed with both conductors, the idea never attained commercial status. Not too long after the opening of his first commercial line, the growth of the industry demanded that service be extended across rivers, lakes and oceans; when that time came, the submarine cable provided a more expedient solution to the problem. There is little reason to doubt that although it cannot be classed as a form of radio telegraphy, the arrangement did have considerable effect on the scientific thought of the period and perhaps led others to attempt further research in communication without wires.

Loomis' Contributions

About 1872 Mahlon Loomis, an American dentist developed and patented a scheme of communication which employed atmospheric electricity and which, he claimed, needed no wires between the sending and receiving apparatus. His claims for his invention were broad and sweeping; in his application for a patent he stated that he would not only be able to "communicate from one continent of the globe to another" but that the method could also be used to "generate Light, Heat and Motive Power." (The capitals are Loomis'.) The specifications went on to say that because atmospheric electricity is more abundant . . . (when) greater altitude is attained" he proposed building "suitable towers and apparatus to attract the electricity" on the tops of high mountains.

Sounds fantastic, doesn't it? Well, it must be admitted that some of Loomis' claims were highly exaggerated and he never succeeded in communicating from one continent of the globe to another, but the cold facts are that he did prove conclusively that signaling could be carried out

Fig. 1. Morse's experiment in sending signals across water.



with his equipment over a distance of at least fourteen miles. And some of his contemporaries thought so well of the idea that Congress was persuaded to consider an appropriation of $50,000 to finance it. The appropriation was never made and Loomis' invention passed into the discard.

Dolbear's Contribution

Amos E. Dolbear, noted professor of physics and astronomy at Tufts College, developed a method of electric signaling that is of more than passing interest to radio men. About 1864 he became interested in electrical communication and in the years following he contributed much to the progress of the industry; his inventions include a writing telegraph and a form of magnetic telephone. During his experiments with the telephone, one of the wires connecting the two stations became disconnected (another fortunate accident) and he noted, to his amazement, that the apparatus continued to operate. He reasoned that some kind of energy transfer was taking place between the cut ends of the wire. He determined to find out just how far the cut ends could be separated and still permit the equipment to work. The result was a system which he patented in 1886. The patent application included a set of specifications and a drawing somewhat like that of *Fig. 2.* In his claims for the invention he was far more modest than his predecessor, Loomis, but then Dolbear was a conservative, cautious professor of physical science. He said "Electrical communication may thus be established between points certainly more than half a mile apart; but how much farther I cannot now say."

Even the most casual consideration of Dolbear's description and the accompanying sketch will bring out two points: First, his invention was different from most earlier attempts at "wireless" signaling in that it did not depend upon conduction through either water or the earth. Second, the fact that the apparatus developed a pulsating current, controll
by the microphone, *M,* in the drawing, indicat
that his method was the closest approach to tr
electric wave telegraphy that had been made up
that time. It is plain that some form of radiati
was responsible for the energy transfer betwe
the sending and receiving stations, although th
radiation took place at a new frequency.

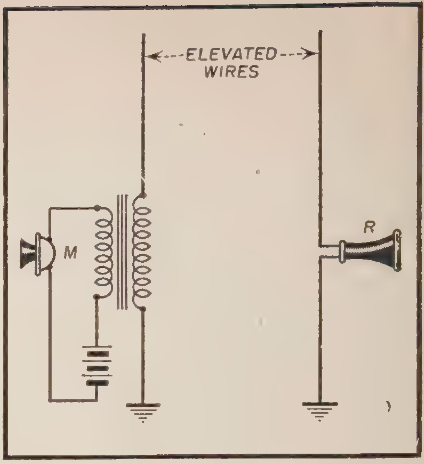
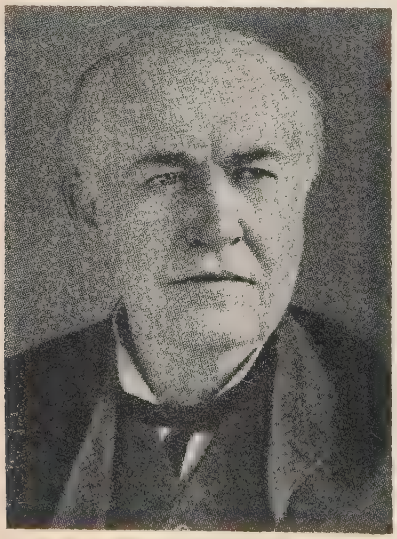


Fig. 2. Dolbear's contribution to wireless signaling.



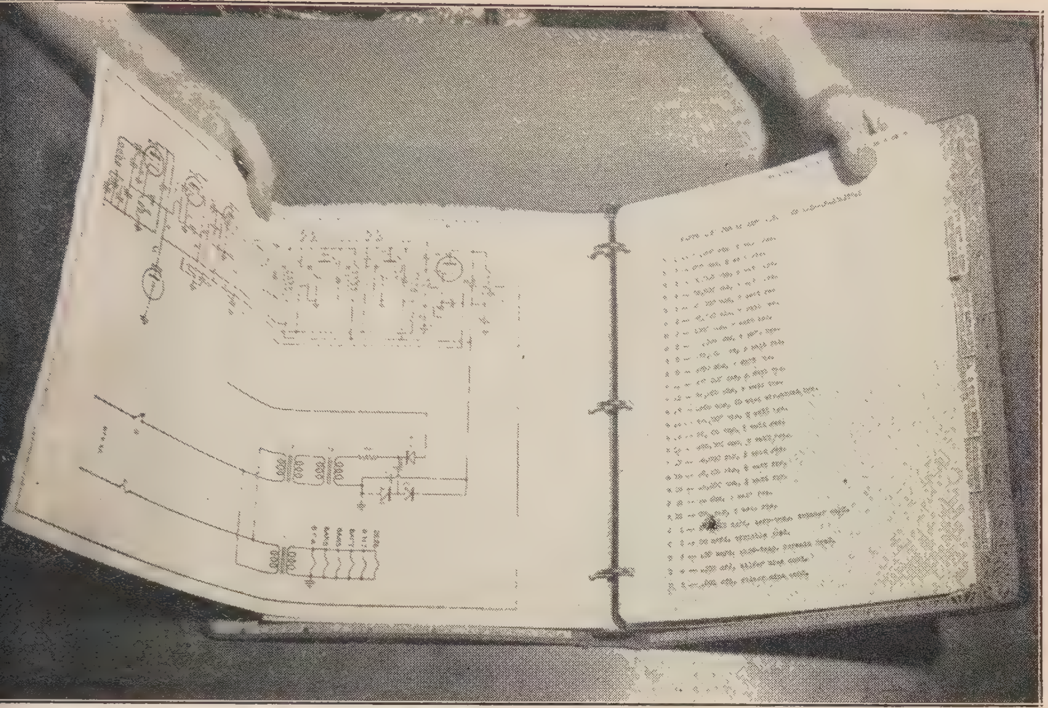
Thomas Alva Edison, (1847-1931)

Contributions of Edison

It would be difficult to find a branch of electric
science which has not been profoundly affected b
the work of Thomas A. Edison, most prolific
American inventors. All radio men are aware tha
it was one of his observations that led to th
eventual development of the vacuum tube. One
his best known inventions, the phonograph, is incorporated in a modern form in a very large percentage of the receivers sold today, and there woul
be no radio transmitters without the generator
which he helped to develop. Less well known i
the fact that he was at one time directly intereste
in the field of wireless transmission and receptio
and developed and patented a system that wa
fairly successful for a time.

In 1875, during the course of an experiment, h
noted that sparks could be drawn from a gas pip
in his laboratory—"sparks of an oscillatory nature'
as he described them. He set up equipment t
demonstrate the phenomenon to visitors to th
laboratory; there is little doubt that at that particular time he was close to an important discovery
for the experiment was singularly like some o
those performed later by Heinrich Hertz. Bu
apparently he was engrossed in other research, fo
he soon gave up the idea. A few years later, however, he again delved into the field of wireless, an
in 1885 he filled application for a patent on a system based upon the inductive effect existing betwee
two coils or wires placed close to and parallel t
each other. The principle of this system is illus

(Continued on page 69



e author's notebook showing how a two-page size photostat is put in the book with the parts list opposite the circuit.

Get Your Circuits Untangled

CLAY WILLCOCKSON*

Any number of amateurs go on from year to ear with a veritable jungle of notes, sketches nd schematics scattered throughout their shack. The author does an excellent job of sizing up he end result in his first few paragraphs. With nly a little extra time this situation can be asily remedied. Read this over to be sure it ight not apply to you. —Editor

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ONE OF THE MOST difficult problems for the average constructor to solve is some way to keep his circuits, parts lists and data gether. The answer isn't to fill old magazines d boxes with rough sketches of circuits and notes ribbled on whatever odd bits of paper were handy hen the building bug bit.

The all too frequent situation is that the builder nds up with a haphazard collection of unidenti- ble sketches and parts lists that have no meaning him a week later and probably never would ve any meaning to anyone else. Why not get ur brainchildren cleaned up and in order? Almost any unit worth building is worth having a drawing made of it that can be neatly put away with a parts list and some description of its characteristics and operation. The simplest way to accomplish this is to get them together in a loose leaf notebook. With only a little effort this notebook can be organized and the reward will be great for the person who will take the time to do the work. Knowing more about his equipment (and you can be sure you will know more after making a drawing and writing a little about it) the builder can more easily repair or rework the unit. No one will deny that the best way to tackle a repair job is to spread out a circuit and take a good look at the overall picture rather than trace out the trouble in a complicated and crowded mass of parts and wiring.

Here are some ideas on how to go about getting your notebook together.

First let's take the problem of the circuits. You probably have gathered these in two principal ways: from magazines and home sketched. These two types of drawings present different problems. The circuits taken from the magazines are already neat and easy to read. If they are small enough,

21 Raymond Hill Rd., So. Pasadena, Calif.

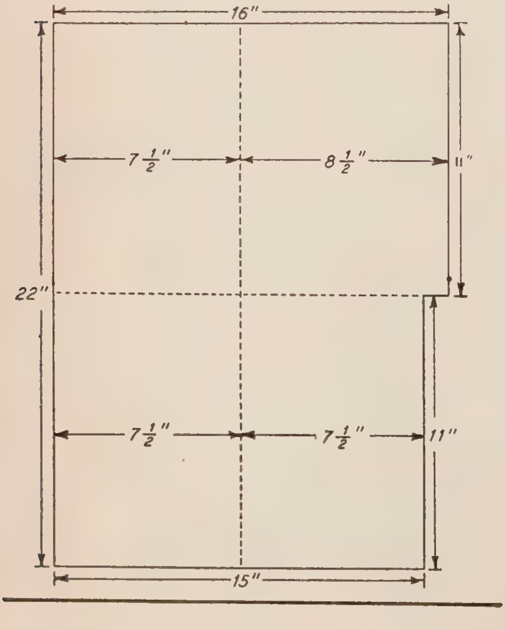
they can be put into the notebook by fastening them to a page of heavy notebook paper and your problem is solved, but it is better to photostat them as described later.

Frequently, however, the builder makes some modifications in the magazine circuit by adding to it (as in the case of adding a power supply) or by taking something from it. In either case the problem is solved in much the same way.

First mount the magazine drawing, or preferably an enlarged photostat of it, on a piece of medium or heavy weight drawing board. This mounting is best done with rubber cement. Then any areas not wanted in the drawing can be removed by cutting through the paper with a razor blade. The unwanted portion can then be pulled from the board. Any rubber cement remaining on the board may be removed merely by rubbing with your finger tips. Any changes in the circuit can now be drawn in the blank area. Take care that your lines join the remaining lines in the original drawing. Use pencil but trace over the pencil lines with india ink. This makes for better photostats.

An addition to the drawing is made similarly. In the case of adding a power supply, where the connections are made directly into the equipment, the power plug symbols are cut from the original drawing and the power supply circuit drawn on the blank part of the mounting board. These lines also should match up with the lines in the original drawing.

Every schematic that you collect is not going to fit perfectly into your notebook. If the circuit is really worthwhile, then have it photostated and trim the print to page size. If the circuit is very large the photostat may be folded from the 16x22 inch size shown in the diagram below.



It would probably be better to make a sepa drawing for each chassis in your equipment. sure, however, that you identify the terminals a terminal strip or socket and plug.

The home sketched circuits require more wc The best solution in this case is a complete dr ing job. Make your drawings show exactly w you have built or plan to build.

Frequently such items as fuses and a.c. switc are forgotten in the drawing, but as long as th are in the equipment, why not put them in drawing? Lay out the drawing and take the ti to make it easily understood. A little time taken make your drawings neat will save a lot of ti later when you want to use them.

Now to get these drawings into your notebo Here are some suggestions that you might fi helpful:

(1) Have photostats made of all your drawin This is the best way to get the drawings to uniform size. When you have your photosta made, always ask for the negative photostat a put it away where it will be safe. If you shou damage your original photostat, you can take t negative back for another copy just as you with a snapshot negative. Your photostat shou hold up indefinitely.

(2) Have the photostat made to fit the notebo you intend to use. If the drawings are too larg to be reduced to the size of a notebook page wit out being too small to see from a distance, as likely to be when you are working with it, have th photostat made the size of two or four notebo pages and fold them. This won't hurt the phot stats unless they are used constantly and ove a long period of time. Suggested methods fo folding the drawings are shown in the accompany ing diagram and picture.

(3) It makes the page look a little more pro fessional if you draw a border line about three eighths of an inch in from three sides of the page The other side is the one to punch the holes fo the binder rings. The line on this side should b about one and three-eighths inches from the edge Your page will stand handling better if reinforcement rings are used around the binder ring holes.

Now for the parts lists and text. Photostatic copies of magazine texts can be put in your book if you like. But the most satisfactory method is to retype the original text if the drawing is from a magazine. This makes it possible to make any changes in the original text such as adding your own comments on your changes and leaving out the author's glowing description of how wonderfully he thinks the equipment performs. The descriptions of this sort in the magazine are to interest the reader in the article and won't be of any help in building the equipment. You must have liked his idea in the first place or you wouldn't have gone this far with it.

If you will take the time to make a book of this sort, you will find that in time you will have a reference and construction book tailored to your tastes. You can be almost as proud of your book as you are of your brand-new, meter-studded powerful little five watter.

Ionospheric Propagation Conditions

GEORGE JACOBS, W2PAJ*

N JANUARY, RADIO PROPAGATION CONDITIONS tend
to be quite similar to those in December.
The sun is moving northward again, which means
t daytime MUFs are decreasing, and night-time
JFs are increasing. The trend in January is for
ghtly less openings on 10 meters, and for the
enty meter band to stay open about an hour later
n it did during December.

Vith the start of a new year, it is desirable to
iew the propagation trend of the past year, and
if we can determine what the ionosphere may
e in store for us during 1952.

ropagationally speaking, 1951 started off below
. January, February, March and early April were
racterized by a series of prolonged severe iono-
eric disturbances. Towards late April radio con-
ions improved, and May, June, July and August
re actually above normal, with MUFs and sun-
t counts higher than the general trend had
viously indicated. By September radio conditions
urned to normal again, and October and Novem-
were just about what one would expect during
s downward trend. I believe everyone will agree
t on ten and twenty meters, DX conditions were
siderably poorer in 1951 than during 1950, with
ditions on forty and eighty about the same, if not
ghtly better than in 1950.

The sunspot numbers continue to decrease, but
a slower rate. The propagation charts for this
nth are based on a predicted smooth Zurich sun-
t number of 57. The smoothed monthly sunspot
nbers throughout 1952 are expected to run from
high fifties down to the low forties or lower.
erefore, general average radio conditions through-
1952 will be poorer than for corresponding
iods of 1951. DX will still be possible, especially
the lower frequencies but the poorer conditions
uld be very noticeable on east-west DX paths on
meters and to a lesser degree on twenty (see
t. 1951 *CQ* page 40).

asic propagation data used for determining the
pagation charts has been obtained from the
tional Bureau Of Standards Series D-86 publica-
entitled, "Basic Radio Propagation Conditions for January, 1952." Solutions for MUF and LUHF (see July, 1951 CQ pages 46-47) data are based upon methods appearing in the National Bureau of Standards Circular 462, "Ionospheric Radio Propagation."

The Charts are based upon an effective radiated CW power of 150 watts using an antenna that radiates at a vertical angle of less than 20 degrees.

General Propagation Conditions for January, 1952

The following is a brief commentary on expected propagation conditions for amateur circuits from the United States to the five major areas of the world. For times of the most probable band openings for any particular circuit refer to the *propagation charts*:

EUROPE:

Ten meters is expected to start to taper off on this circuit during January. The MUF is expected to rise high enough to permit some openings to the East Coast and Central sections of the USA. From the Pacific Coast, because of the long distance of the circuit and auroral zone penetration, conditions on ten meters are expected to be poor with very few openings, if any.

Good DX conditions are expected on twenty meters. During early January conditions on this band will be just about the same as they were during December, however, by the last week of January it should be noticed that these circuits are holding up an hour or so later than they did during December. Conditions favor the east and central areas of the USA, but frequent openings should be possible from the Pacific Coast.

Conditions on forty and eighty are expected to be much the same as they were during December. Strong signals should be noticed on forty just before sundown local time, fading out on some nights a few hours after sundown and coming in again at sun-up at the European control point. Speaking of control points, it is important to remember that the control point is that point in the ionosphere from which the signal is bounced, or refracted, back to earth. For trans-Atlantic circuits, which are multi-hop transmissions, the signals may bounce between the earth and the ionosphere many times, introducing the possibility of many control points. However, it has definitely been established that for such a multi-hop path, the actual control points are located 2000 kilometers (1,250 miles) from each end of the circuit towards the center of the path. Forty meters therefore is expected to stay open until sunrise at the eastern control point which is about 1000 GMT.

Fair to good DX conditions are expected on 80 meters, but with signal levels lower than on forty. During ionospheric disturbances, that is when WWV is noted sending W's or U's, the MUF will on

(Continued on page 59)

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20 Bedford Ave., Brooklyn 10, N. Y.

Last Minute Ionospheric Storm Predictions

elow normal radio conditions are expected Jan-
ry 1-2, 6-10, 21, and 26-27. Ionospheric disturb-
nces affect, to a far greater extent, transmission
aths passing through or near the auroral zones,
d they have little or no affect on other trans-
ission paths. Periods of better than normal radio
nditions are forecast for January 3-5 and 14-18.

JANUARY 1952

EAST COAST TO: (Centered on Washington, D.C.)	10 Meters	20 Meters	40 Meters	80 Meters
	ALL TIMES IN GMT			
Scandanavia	1400-1600 (0-1)	1100-1300 (2) 1300-1800 (1) 1800-2000 (3)	2130-0600 (3-4) 0800-1000 (2-3)	2130-0930 (3)
Great Britain & Western Europe	1400-1700 (3)	1130-1400 (3-4) 1400-1800 (2-3) 1800-2030 (3-4)	2130-0600 (4) 0900-1000 (1-2)	2230-0900 (3-4)
Balkans	1400-1630 (2-3)	1100-1300 (3) 1300-1730 (1-2) 1730-2100 (3)	2100-0600 (3-4) 0900-1030 (2-3)	2200-0800 (3)
Central Europe	1400-1600 (2-3)	1130-1300 (3-4) 1300-1700 (2) 1700-1900 (3-4)	2130-0600 (3-4) 1000-1100 (2)	2200-0800 (3)
Southern Europe & North Africa	1330-1800 (3-4)	1100-1300 (3-4) 1300-1830 (2-3) 1830-2300 (4)	2100-0600 (4) 0600-1030 (3)	2200-0900 (3-4)
South Africa	1330-1830 (3)	1030-1800 (1-2) 1800-2300 (3)	2100-0400 (2-3)	2200-0400 (1-2)
Near East	1300-1600 (3)	1100-1900 (1-2) 1900-2100 (3-4)	0200-0500 (2-3)	0200-0500 (1-2)
Central America & South America Northern Section	1500-2030 (4-5)	1100-1500 (4-5) 1500-2000 (3-4) 2000-0100 (4-5) 0700-1000 (2)	2200-1230 (5)	2200-1200 (4-5)
South America	1230-2000 (3-4)	1030-1230 (3) 1230-2200 (1-2) 2200-0030 (4) 0500-0800 (1-2)	2200-0930 (3-4)	2200-0930 (2-3)
Hawaii	1800-2230 (4)	1200-1430 (3) 1430-0000 (1-2) 0000-0230 (3)	0300-1300 (3-4)	0300-1200 (3)
Oceania	Nil.	1230-1600 (2-3) 1600-0000 (1-2) 0000-0200 (2-3)	0800-1200 (2)	0830-1200 (0-1)
Guam	2130-2300 (2)	2030-2230 (1-2) 2230-0200 (2-3) 1530-1700 (1)	0730-1000 (2) 1000-1330 (1)	0730-1330 (1)
Japan	Nil.	2030-0130 (2-3)	0830-0900 (2) 0900-1200 (1)	0830-1200 (1-2)
India	Nil.	1330-1500 (1-2)	2230-0130 (1) 1030-1230 (0-1)	2230-0130 (0-1)
Philippine Islands & East Indies	Nil	2330-0100 (0-1)	1000-1200 (1)	Nil
West Coast USA	1800-2130 (1-2)	1530-1930 (2-3) 1900-0030 (4-5)	0100-0400 (4-5) 0400-1000 (3) 1000-1400 (2)	0130-1230 (4)

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	20 Meters	40 Meters	80 Meters
	ALL TIMES IN GMT			
Great Britain & West Europe	1500-1700 (2)	1200-1430 (3) 1430-1830 (2) 1830-2030 (3-4)	2230-0600 (4) 0900-1000 (1-2)	2330-0900 (3)
Central Europe	1500-1630 (2)	1230-1330 (3) 1330-1730 (2) 1730-1900 (3-4)	2230-0600 (3-4) 1000-1100 (1-2)	2300-0800 (2-3)

JANUARY 1952

ALL TIMES IN GMT

CENTRAL USA TO: (Centered on St. Louis, Mo.)	10 Meters	20 Meters	40 Meters	80 Meters
Southern Europe & North Africa	1430-1830 (3-4)	1130-1500 (3-4) 1500-1900 (2) 1900-2230 (3-4)	2130-1000 (3-4)	2300-0900 (2-3)
South Africa	1400-1830 (3)	1100-1830 (1-2) 1830-2300 (2-3)	2200-0400 (2-3)	2300-0400 (1-2)
Central America & Northern South America	1430-2030 (4-5)	1200-1630 (5) 1630-2030 (3-4) 2030-0130 (5) 0500-0900 (2)	2300-1230 (5)	2330-1100 (4-5)
South America	1330-2200 (4)	1200-1500 (4) 1500-2100 (2) 2100-0200 (4-5) 0600-0830 (2)	0000-1030 (3-4)	0000-1000 (2-3)
Hawaii	1800-2230 (3-4)	1630-2000 (2) 2000-0330 (4)	0230-1500 (4)	0230-1500 (3-4)
Oceania	2300-0030 (0-1)	1430-1730 (2-3) 1730-0000 (1-2) 0000-0430 (2-3)	0800-1400 (2)	0830-1300 (1)
Japan	Nil.	2100-0200 (2-3)	0830-1330 (2-3)	0830-1300 (2)
Philippine Islands & East Indies	Nil.	2230-0130 (1-2)	1000-1400 (1-2)	1000-1400 (0-1)
India	Nil	Nil	2330-0130 (1-2) 1200-1300 (1-2)	2330-0130 (0-1) 1200-1300 (0-1)

ALL TIMES IN GMT

WEST COAST TO: (Centered on Sacramento, Calif.)	10 Meters	20 Meters	40 Meters	80 Meters
Europe	Nil.	1500-1830 (2)	2230-2330 (1-2) 2330-0800 (0-1) 0800-0900 (1-2)	0130-0630 (1)
Oceania	1900-0100 (4)	1530-1830 (2-3) 1830-0300 (1-2) 0300-0500 (2-3)	0730-1400 (2-3)	0000-1400 (1-2)
Japan	2230-0130 (2-3)	2130-0200 (1-2) 0200-0400 (3)	0600-1600 (2-3)	0700-1500 (2)
Philippines & East Indies	2230-0130 (2-3)	1730-2100 (3) 2100-0300 (1-2) 0300-0430 (2-3)	1100-1400 (2-3)	1100-1400 (1)
Guam	2030-0100 (3-4)	1730-2000 (3) 2000-0200 (2) 0200-0400 (3)	0930-1500 (3)	0930-1500 (2-3)
Alaska	2100-0000 (4)	1830-0000 (3) 0000-0300 (4-5)	0200-1400 (4)	0300-1300 (3-4)
Marshall Islands	2000-0100 (3-4)	1830-1930 (2-3) 1930-0200 (1-2) 0200-0430 (2-3)	0630-1430 (3)	0700-1400 (1-2)
India	Nil.	0130-0330 (1-2)	1230-1500 (2) 0300-0400 (1-2)	1230-1500 (0-1)
South Africa	1630-2230 (3)	1330-1430 (2-3) 1430-2000 (1-2) 2000-0230 (2-3)	0200-0800 (1)	0200-0800 (0-1)

SYMBOLS EXPECTED FOR PERCENTAGE OF DAYS OF MONTH PATH OPEN

(0) None (1) 10% (2) 25% (3) 50% (4) 70% (5) 85% or more.

The YL's Frequency

Conducted by LOUISA B. SANDO, W5RZJ*

ONE LAST CONVENTION to report, and that about winds it up for the year. The Central Division Convention at French Lick Springs, Ind., in mid-October brought together only a few YLs. Those attending: W1BCU, Peg Wells; W0CMV, Opal Sisk; W9JUJ, Peggy Coulter; WN9PFO, Esther Clifton, and ex-W9EFW, Esther Davis.

But although the YLs were definitely in the minority, they were nevertheless very much in the spotlight. W1BCU, Peg, won the award as the ham from the greatest distance, and W9JUJ, Peggy, received an award as being the outstanding amateur in the entire State of Indiana for the past year and also won first place as having the best commercial mobile installation at the convention. FB, gals!

Ex-W9EFW, Esther, was in charge of all the YL and XYL activities. All of them who registered received a gift of a Coro bracelet. Saturday p.m. they played bingo, with 60 prizes being awarded. This was followed by a tour of the gardens at French Lick Springs, the banquet and dance. Sunday a.m. there was a ladies' breakfast at which W1BCU gave a talk on YL ops and their activities.

Now for a word of special interest to XYLs. Ex-W9EFW adds: "Our club (XYL) from Ft. Wayne had speakers explaining to the women how they, too, could form a club in their community and join us in being fellow members to our Alpha Chapter of the XYLs. There is no charge for this and we would be glad to have any amateur's wife start a club in her locality. The out-of-State (Indiana) gals have to get permission from their State to use XYL as we do have it chartered, but there is no charge for this and we in turn would grant them the use of XYL. There is a possibility of enough clubs starting so that in the future we, t could have our own conventions—which is wh our chapter would like to do. Then, too, the O could always depend on the XYLs to take over t women's activities at these ham conventions. I b lieve we in Ft. Wayne are the only club which h seen to it that all the women attending a conve tion received a gift."

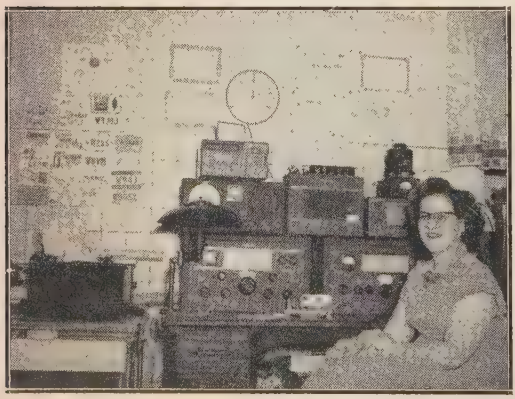
Peg, W1BCU, who won the greatest distan award, had gone along with her OM on a busine trip. She reports a wonderful time and followi the convention they spent a night with W9JT Louise Beringer, YLRL prexy. Then to Detroit visit Peg's Dad, then Cleveland to see friends, ar on home stopping in Three Rivers, Mich., lon enough to see W8WUT, Avis, and her OM.

Best Ham Award to YL

Congratulations from all of us to W9JUJ, Pegg Coulter, on winning the award as the best all-aroun amateur in the State of Indiana for the past yea Peggy explains that the award is made each yea by the Indiana Radio Club Council, which is composed of delegates from the many clubs in th state. A letter from each club is sent to the Counc nominating an outstanding amateur who, club members think, deserves the award. All nominations ar then sent to a judging committee selected out o the state to judge the letters, from which all identification of the person has been cut out so the judge have no idea who they are judging. Their decisio is final. Naturally, Peggy is very happy over th award!

In addition to the above award, at the Conventio Peggy won first prize for the best commercial mobil rig. "All the honor for that should go to my OM though," says Peggy, "for he did all the work o installing it. However, he doesn't have a license so it is my rig. My mobile consists of a Motorola T 69-A running 24 watts output to a Premax quarter-wave whip. The receiver is a Motorola with a Tri-band Conset converter ahead of it. The main point I believe for my winning was the well-kept log and operators license—of which you need both even in mobile operating—hi! My prize, of which I am very proud, is a Cardax Model 950 mike."

Peggy was bitten by the radio bug while visiting a friend who has a nephew who is a ham and they listened for him on the short-wave band of a BC set. "When I heard how friendly all the hams were the bug started nibbling," says Peggy. "We then contacted a ham in town and he made a schedule for us to talk to the ham I had listened for that day. That was just a start for we continued going to the



W9JUJ, Peggy Coulter, winner of the award as the most outstanding amateur in Indiana for the past year.

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*Address all correspondence to 959C-24th St., Los Alamos, New Mexico al ham's QTH and I would talk to different hams over the country. In the summer of 1949 we nt south to see the first ham I had ever talked to d stayed there two weeks. We lived ham radio. hen we came home we brought with us a Collins A-1. I started learning the code, which was a rd pull but finally made it, and received my ket in March 1950. At first I worked mostly 10 one but by November I was deep in c.w. on 40 d 80. It was soon after that I got started in traffic d the more I handle traffic the better I like it. ade my first BPL in February this year and have de it every month but the one my rig and re- ver were in the factory for repairs. One month made 2183 points for BPL."

W9JUJ started a 2-meter net for the local hams d was net control until her converted 522 went the air. Other ham activities include OBS, ORS, C, and she holds the honor of being the first in the Fifth Army MARS and also the first ilian. She has just been appointed route manager QIN (the Indiana c.w. net) after being a member a year. She also is filling her second year as retary of the Indiana Radio Club Council, of ich she is the only YL member.

'I don't want to forget to mention my poor family," ds Peggy. "My OM, John, is one swell guy to get my fine Collins set-up and help keep me on the as well as put up antennas. We also have a eet daughter, Nancy, 11 years old, and a little boy, nnie, aged 4. I do my own work—which isn't more than I have to—but so far none of the nily has lost any weight due to my ham radio ivities—hi!"

Again, congratulations to our "YL of the year"!

/OM Contest

Next important date on the YLRL calendar— d for all OMs as well—is the week-end of February 24. This will be the occasion of the 3rd annual /OM contest. Any licensed OM is eligible to npete but YLs must be members of YLRL. Watch details in the February issue.

s Angeles Club

The YL Club of Los Angeles met on October 13th celebrate its 5th anniversary. Special guests of nor were seven of the ten original members who re present at the first meeting of the club, includ- : W6UXF, 6WQK, 6VWR, 6WRT, 6NZP, 6UHA d 6WSV. Ten other gals helped celebrate the asion: ex-VE3OL, W6MFP, 6KER, 6JMC, 6CEE, VF, 6NLM, 6JMS, 6EHA, and newly licensed AR. 6UHA provided beautiful floral decorations. e month ahead promised to be a busy one getting Christmas package of clothing and toys off to Japanese orphanage—which they just found out nsists solely of boys ages 10 to 16, instead of the months to 15 years originally reported! QSL ds and pix will be included with the gifts, at 2MB's suggestion, so the kids can see who the s are.

re and There

W7HHH reports she was kind of left out of the tional Convention News (October *CQ*). "I was the picture but was cut out of the view in *CQ*. so, I won one of the nice door prizes at the YLRL akfast—a Telechron electric clock." Sorry, Bea, we did get you in the list of those attending. Bea adds that she was thrilled to have W3OQF, rbie Houston, OM W3MAX, and their jr. op, key, spend an evening with her.

Bea also reports a nice YL net on 75 in the Northwest. "Only wish more of the YLs could check in," says Bea. "Guess we've had about a dozen different stations but eight in one night is the most. Any YL who can hear us is requested to check in—Monday evenings at 8 p.m. PST on 3900."

Congratulations to W0CCK, Maxine Thompson, and OM, W0BPE, on the arrival of their jr. op, Lorin Jay, on November 2nd. Maxine reports a lot of contacts on 40 this summer and hopes to continue on 40 as well as 10. (Ah, little you know, my friend—but, then, maybe Jay will "cooperate"!)

An OM Speaks

We've heard frequently that many an OM enjoys this column as much as the YLs, and it's a real pleasure to hear from them, too. Latest is this note from W7ODI: "Your column in the September issue of *CQ* contained a story that was particularly interesting to me. It concerned a Canadian YL, Juanita Wood, VE7AYL. She used to be one of my c.w. buddies on 80 meters back in the days when I operated W7ODI as a civilian. I also knew her instructor, Jack, VE7APK, and it was through him that I first met Nita. She was operating his rig, and I was surely amazed to find that the smooth clean fist doing 20 or 25 w.p.m. was that of a 13-year old gal. At that time I'd been on the air about six months and was only then getting to be able to copy code with any success to speak of. A good buddy of mine, W7ODA, also has QSO'd her many times, and I was really tickled at him one time when Nita poured on the coal and snowed him under. Of course his pride was deeply wounded, and he got to be an excellent c.w. op after that.

"I do enjoy your column even though I'm not a YL—hi! Keep 'em comin' "—Larry Slagle (ATAN USNR).

New YLs

Again we have a "youngest YL"—congratulations to Alice Bieberman on becoming W3SKQ. Alice is just ten years old. She is the second daughter of W3KT and sister of Jane, W3OVV, formerly holder of the "youngest YL" title. It all seems to come natural in this family! W3SKQ received her ticket, General Class, early in November and, along with W3OVV, may be heard on 20 c.w.

Congratulations to another new YL on the air—W1VBM, Norma Jean Guile, of Norwich, Conn. Norma is 18 and a senior in high school. "At present I am the only YL in Eastern Connecticut," says Norma. "I hold an RCC certificate, a code certificate, and recently became a member of the Tri-City Radio Club of New London County. Was never interested in radio until last August. It took me just two weeks until I took my exam for the Novice Class license. Held that for six weeks and then passed my General Class exam. Am now on 40 c.w. using an 807, 75 watts, v.f.o., and an NC101X receiver. Keep up the good work with the YL's Frequency."

YL of the Month

And here is the story (for which our thanks to W5CA) of another new YL on the air. But hers was not a matter of studying for only two or six weeks. Rather, hers was a struggle over many months, a story of courage and persistence under almost insurmountable difficulties. Pat Parks of Rotan, Texas, is the YL, and her treasured call is W5TTU.

Pat feels that ham radio has saved her life. Her troubles started in '46 when, following several bouts with pneumonia, she developed tuberculosis of the

(Continued on page 68)

the VHF news

Conducted by
W. E. McNATT, W9NFK*

THANKS to the gang who wrote or talked to me about the initial contribution in the November issue. I'm happy to report that all comments received were favorable; maybe *all* comments weren't received, however!

Several loyal supporters of "Brownie", W2PAU, reminded me that he did a swell job in these columns, and trusted I would do likewise. I assure you, I will do my best! An outstanding point, brought out by several well-wishers, is that they understand that a certain degree of *time* is required for proper orientation of a new column. Other new friends noted my pre-war activity on 80-40-20 c.w. and plea for support of c.w. interest on v.h.f.; c.w. activity exists to a greater degree than many fellows realize, but more about this later in the column.

Activity

A very prevalent complaint—typical at this time of year—about activity is, in effect, "I know darn' well that the band is open many nights, but the gang just isn't there. What can you do to convince the fellows that good conditions exist after September—October?" Well, it's pretty difficult to convince anyone about anything until he's had direct experience that proves one's contentions. And, the job, therefore, is to persuade the "June-September grade" of v.h.f. enthusiast on 2 meters and higher to stick on the band for another month or so with the same effort he exerts during the v.h.f. "season, the summer months," as he defines it. he would then find that band openings occur during the cold-weather months; they have occurred this year, as in the past years, but the complaint still comes from "The Faithful Few On Two," "Why do the fellows leave the band so early?" Occurrences of 2-meter DX during the winter months have been recorded in the literature of amateur rac so the stories are available to any v.h.f. ham willi to thumb through the reports of W2PAU, W1HI and W9NFK. It was, I believe, only 2 or 3 Dece bers past that W8WSE, Mike Hoychuk, Garfie Heights (near Cleveland, O.), roared into India Wisconsin and Illinois 2-meter receivers; W8WJ BFQ have been worked on several successive w ters during December, January, and February by t same gang. Similar DX, in terms of miles, has be worked on the east coast and in the southern sta as well as from Minnesota.

There are counter-arguments for the defense the "June-September" grade of v.h.f. man. I know, a fact, that a lot of fellows minimize activity duri the winter months so that they can re-build or oth wise improve the gear; many operators return school—college or otherwise; in the area of cold climes, the basement or the attic is too cold comfortable operating—and so on.

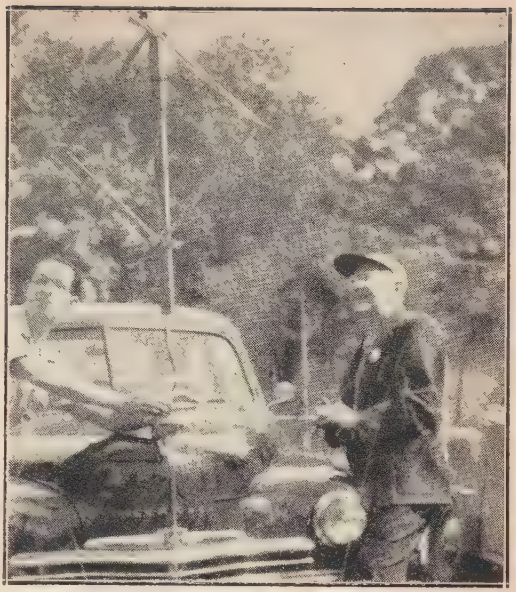
Reception of Auroral Reflected Signals

Ken Bowles, W2ZGP, offers some very interesti information in response to W2PAU's comments the November column regarding Auroral reflect signals.

"I call your attention to a paper on the subje of 'Response of a Directive Antenna to Incohere Radiation' page 677, *Proc. IRE*, June 1951. The ma idea to be gained . . . is that for a scattering regi which fills a given solid angle at the receiver, (any antenna which views that solid angle will c better than one which views a *larger* solid angl (2) any *decrease* in the solid angle viewed by t antenna—in order to increase the gain for pla waves so that only part of the scattering region seen—will make *little or no* improvement in th received power. Extending this to the transmitti case, it becomes obvious that a transmitting anten which illuminates a smaller portion of the scatteri region than that which is 'seen' by the receiver wi *not* do better than another transmitting antenna rad ating the same power but which illuminates the *sam* region as 'seen' by the receiver. The increase in ga is just balanced by the decrease in scattering are

Pictured at left are most of the 100 Canadian an U. S. amateurs who attended the fourth "do" of th Southern Ontario VHFers held under the sponsorshi of the Oshawa Club. The chairman was VE3AZV. Th next "do" will be in Oakville, Ont., under the guidanc of Tom Stewart, W2TBD, on January 19th.

**Send all contributions to W. E. McNatt, W9NFK, 2433 Elder Lane, Franklin Park, Ill.*



2EWN, Sam, of Haddonfield, N. J. and W2BDI, Ed, Merchantville, N.J. (with hunting costume!) in- ecting W2EWN's "Cubical Quad" DF-ing antenna. e "Quad" is one of the most popular 144-mc ection finding antennas in these parts, due to its ady adaptability to either polarization, its small ight and relative immunity to the effects of the adjacent metal of the car body.

"Our recent obervations, using the 100 mc radar oger Thayer's work) indicate that the Auroral re- ctions come from either the very narrow pencil- e Ray structures or from 'Draperies' which are ade up of many Rays. When any one ray appears in e sky, it can be '*d.f.* 'd' on quite sharply. At any e time during a big aurora, there may be several these rays going at widely different parts of the y. While the radar can sort these out—since they ually appear at different distances—the amateurs ll view signals from a wide range of angles. The low with the wide beam will 'view' or illuminate all these rays and get the full benefit of all of them. e fellow with the narrow beam may orient his tenna by listening to a station with a wide beam d thus see *no* sharp d.f. He may be unlucky enough aim most of his power between two rays and thus se out, or he may aim his power right at a ray d thus do about average. Since the position of the lecting regions is continually changing, the station th the wide beam is probably at a slight advantage.

"The radar also seems to indicate that most reflec- ns come from distances 300 miles or greater. The obable region of scattering is the vicinity of the region, where most auroras are seen, so the height about 100 km. This means that the major part of e reflections come at angles of elevation under ten grees, and the fellow with a sharp vertical pattern at an advantage."

Thanks, Ken, and the *Cornell Ionosphere Project!*

2ZGP is proceeding with the plan for remotely- ntrolled transmitters on 6 and 2 meters, located WKRT's hill. The 2-meter antenna is already up; e 6-meter array was scheduled for erection in late vember. The 2-meter array consists of 16 elements, high by 2 wide, backed by a screen reflector. The meter antenna is comprised of 6 elements arranged like fashion; the screen reflector attenuates the rect signal toward Ithaca. Both antennas are pointed the north and tilted skyward about 3°. W2ZGP and 2nd op Rolf, W2TTU, thus hope to make optimum coverage of the auroral region. Control will be effected via 430 mc, and operations are expected to be underway in mid-January on *50.8* and *146.2* mc, using *c.w., only*. Regular operations from W2ZGP will continue, as at present, but reports on the remote-controlled station will be appreciated.

"THE FAITHFUL FEW ON TWO" CERTIFICATE

For the past 3 years, I have planned to ssue certificates to the 2-meter stations that can usually be depended upon to be active nost of the time throughout the year. Lack of time prevented this until now. In order to avoid this being a "one-man" deal, I'd ap- oreciate your ideas as to basic qualifications for "The Faithful Few On Two" certificates. Then, as soon as qualifications are estab- ished, they'll be published, here, and you may submit your nominations. Please "Do It Now" —write, today! Thanks! —W9NFK

C.W. and Auroral Progagation

This topic has been covered, many times, in many v.h.f. publications. But, since the active v.h.f.-minded group of hams usually rotates membership from year to year, it seems appropriate to review some basic pointers for those newly interested in working auroral v.h.f. DX:

1. Turn your beam to the north, as a starter.
2. Horizontal polarization, at this time, seems to be used most often, although cross-polarized contacts have and do occur with some loss of signal strength.
3. Send c.w. slowly, about 5—10 w.p.m., *not* because the guy at the other end can't copy faster but rather because the nature of auroral propagation is such to require it. Fade and rise of the received signal occurs so rapidly that a distinct, low-frequency modulation (amplitude and phase) is observed; this is what makes phone unusable except at relatively high signal levels. Such levels are ordinarily obtained from the direct path rather than from the auroral reflections, however.
4. When you hear the "garbled" c.w. signal, rotate the beam slightly to east or west of north for best average reception. No definite recommendation can yet be made for beam rotation; some mid-western hams have found that the beam should be slightly east of north for best reception of eastern signals. Yet, there have been instances where stations in the eastern states have had to turn their beams to the *west* of north in order to receive stations located farther east. Obviously, much remains to be learned.

5. Cyclic occurrence of the auroral phenomenon is presently predicted on the basis of a 27-day period by the Central Radio Propagation Laboratory Warning Service of the National Bureau of Standards, Washington, D.C. The CRPL Radio Warning Service Bulletin is issued on every Tuesday and Friday. The CRPL is staffed by a number of hams, several of them v.h.f.-minded, and they'd be glad to hear from you regarding any type of unusual propagation. So, would we!

The VFO on VHF

At the time this subject was brought up by W2PAU I was ready and willing to fire back my opinions on the matter, but had no time to do so. In the interim, editorial relationships changed, so—now—I can only offer the comments of others, first, as a matter of due courtesy. The following comments are not from an anonymous source; I know him, and "Brownie" knows him. But, I respect his wish to not be identified. This is a consideration always accorded while I produced the independent *"The VHF News"*: anonymous letters were not considered, but signed letters requesting deletion of identity in publication were recognized. At any rate, the man makes sense:

"About the use of v.f.o.: It is not the *use* that any one objects to; it is the *abuse.* I see no reason for objecting to the v.f.o. (which has) some advantages that are worth while, such as break-in on local QSOs when the participants are not aware that the band is open. Most of us are sick of the low-frequency type of round-table where all you do is repeat call letters, and nobody says anything worthwhile. Then, too, owing to the use of sharply directional beams, three and four-way QSOs are, too often, a strain when the stations are well separated. So, a little judgment is in order."

When W2PAU's comments about the use of were read, I hesitated to think to myself just my reaction was to the proposal because the had come and gone, long ago, in the midwestern Since people are "people" and hams are "hams", people are hams, it must be expected that—in of the usually-expected unselfishness of hams their considerateness—hams will sometimes be *pec* even if they are on the v.h.f. So it was, in the west—at least—about 3 years ago that the came into use on 2-meters. But, it lasted for on short while—for one main reason, stated by quoted, unidentifiable friend: "It is not the *use* any one objects to; it is the *abuse.*"

The midwestern gang simply did not stand the tactics of some of the low-frequency bo "sliding-in" on a QSO; heterodyning the other g local or DX, in order to get a contact; not know "where" to tune for the v.f.o. man because of inconsistent practices. Let me say, however, that had only 3 or 4 v.f.o. operators. But, that num was sufficient, apparently, to impress the crys controlled operators unfavorably. At this time, th is at least one two-meter station v.f.o. controlled the Chicago area that operates *successfully* beca he *does not abuse* the "advantage." I have rela this history of v.f.o. on v.h.f. in the midwest only illustrate the fact that the v.h.f. gang—as I know —considers the v.f.o. as a tool *likely* to be misus as it has been during many a DX or Sweepsta contest on the lower frequencies. Maybe that's t reason a lot of us are on v.h.f.

VHF and CW

A new experience to me is the expression by se eral v.h.f men that "If, in order to enjoy c.w., I mu stay on low-frequencies—there I'll stay!" Well, no just a darned minute, fellows! The phone gimmi came about, I believe, as a result of the post-Wor War II band re-openings, when the 2-meter ba came into prominence, about 5½ years ago. that time, interest in v.h.f. was unusually high b cause (1) the v.h.f. bands were opened, first; (2 many hams were intrigued by v.h.f. because of the war-time experiences with v.h.f. and microwave rada and thus became convinced of its usefulness; (3 readily-available war-surplus 'phone gear at astoun ingly low prices enticed many a ham into the beli that he was sincerely interested in v.h.f.—with 522 without b.f.o.

The use of c.w. for communications on v.h.f.— 50 mc and higher—progressed more rapidly on meters than it did on 2 for the simple reason tha the more-experienced pre-war 5-meter gang returne to 6 meters and c.w. whereas the 2-meter gang i only beginning to really use it. Some of those wh use c.w.—*not* m.c.w.—even when there's no aurora propagation are W1IZY, W1HDO, W2NLY, W3QK W3GKP, W3EYY, W4AO, W8WRN, W9EHX W9WOK, W9GDM, W7JRG and many, many others If you want to do so, we'll start a registration lis of those stations capable and willing to use c.w in addition to 'phone; also, frequencies.

Reading from left to right: W3BLF, Russell, of York Pa.; W3KUX, Wally, of Washington, D.C.; an W3LMC, Howie, of Baltimore, Md. The vertically polarized 3-element two-meter array in the back ground is W2JAV's direction-finding system, rigge up especially for the two-meter transmitter hunt.

West Coast 6 meter men were shocked to learn at Lt. Arthur Trautman, W6DPF had been killed the Korean struggle. W6DPF was in a B-29 that ashed upon landing. Two motors had been shot ut and the weather was extremely bad. Art had een a RASO 6-meter Project Member. He was 33 ears old and had also held the call W9KFB.

W6ZYH, Palo Alto, is looking for early-morning hedules with other early-hour operators on 2 in e L.A.—San Diego areas. Reg works during the vening and is unable to get on two until about :30 a.m. He is on 75, v.f.o., with 100 watts, which an be used to coordinate the v.h.f. schedules. On a pair of 4-65As in the final, 500 watts input, is riven by a 522. The beam is a 24-element job 30 et high. The frequency is 146.25 mc. W6EXH and 6GQZ in Ripon have lined Reg up with some of e valley stations, and now he'd like to push further uth.

Ira Bechtold, W6NCP, La Habra Heights, is re-overing from an illness which put him out of service r several weeks. Ira reports that some of the south-rn California two-meter gang is now in fairly con-stent contact with W6BUT, Taft, W6EHN and 6HBV, Bakersfield. Stations towards the coast—ch as El Segundo, San Pedro, Torrance, etc.—re apparently in line with the path of least resist-nce, over the Ridge Route. In mid-November, 6BUT was heard at W6NCP with considerable utter for the first time. W6CDB, Torrance, has eaded up the drive to work the San Joaquin valley X.

In spite of the big flurry over horizontal polariza-on after the 2-meter DX record was picked off by 6ZL, there are only 2 stations (W6NCP and 6PJA) permanently on horizontal in the L.A. area. ell, the midwestern and southern two-meter gang nally got around to it and enjoy its advantages. hy not give it a serious try between L.A. and akersfield There are some nice pictures of W6ZL, on Lusk, co-holder of the 2-meter DX Record, nd his antennas on page 559, *"Short Wave Mag-zine,"* November, 1951, in G2XC's "VHF Bands."

The Whittier Emergency Net is utilizing 145.28 c more than before, although stations are still tive on 10 and 75.

W6DNX, San Francisco, asks for more articles 2 meter antennas and transmitters. These will forthcoming in the future; in the meantime, u're all invited to send in your own articles on h.f. gear. If they're acceptable, you'll be rewarded r your efforts. See *"The Private Life of CQ"*, ovember, 1951.

W7JRG, Ken Erickson, Sheridan, Wyo., enjoyed 6 meter opening on October 28—the first heard ere since August 15th. Ken first heard a W8? about 1612 MST on about 50.15 mc and is certain at it was W8NQD, because Tom was worked later that frequency. Between 1644 and 2111, W7JRG orked W9GYX, MFH, ALU, VZP; W8NQD, LPD; 0INI, W5OCP; heard W5AJG beacon, strong; 5SFW QSO W7HEA; W9ALU QSO VE5NC. The nd closed at 2130 MST, Ken reports, with the ded hope that things will pep up more often.

As for 2-meter activity, W7JRG says little of ectacular interest has occurred since August 30, st, when W9EHX heard his c.w. on tropospheric opagation. The Sheridan-Gillette, Wyo., schedules ve served to show the progressive degradation of nditions over the path to W7HNI, but the tests being continued.

"VHF-UHF DX SCOREBOARD"

Please send your scores for 6, 2 or higher frequency bands to W9NFK on a postcard separate from other reports (for convenience of filing) so that the "Scoreboard" can appear in these columns. The form, for example is:

Call	States	Call Areas	Other	DX-Miles
W8BFQ	21	7	VE3	800?

"DXpedition"

FP8AH, "Sandy" Cole, W1PVF, kindly provides additional information on the recent expedition to St. Pierre: Most of the 2-meter gear was loaned to FP8AG and FP8AH, and consisted of an 829B final, 50 watts input, to a 10-element beam, horizontal. The receiver was a W1HDQ converter ahead of a BC-348. The expedition was delayed by transportation from Nova Scotia, and by poor weather after arrival at St. Pierre.

Finally the antenna was put on the roof, and supported by the chimney at the hotel.

"The chimney belched black smoke which covered the antenna with soot and also jammed up the electric motor beam rotator," says Sandy. *"Every* morning, we had to get up on the roof and repair the damage done to the beam after wind and rain during the night—it was rough, believe me!

"On the night of August 31, we were on, listening and transmitting most of the night without luck. I'm inclined to believe our failure on 2-meters was due mostly to the difficulties we had with the beam, and not to location and conditions, since both seemed ideal.

"From the roof of our hotel, we had a clear path to the northeast (to VO-land), east and south to Nova Scotia. To the west were rugged hills, several hundred feet high.

"The R.I. and others connected with radio work on St. Pierre were very interested in our v.h.f. tests and inquired as to our results every night we were there. They even offered us the facilities of the local B.C.S.W. station to the extent that we didn't QRM their transmissions.

"Our rig in the 80-40-20 meter bands was a converted BC-457 ARC-5, running about 40 watts. On the 50-cycle line, we really put out a wicked signal and it brought in about 250 stations apiece for FP8AG and myself. We operated in half-hour shifts and really kept everybody quite confused as to whom was operating the station.

"A lot of 2-meter men contacted us on 20 c.w. and phone and made schedules with us on v.h.f.: however, nothing was heard or worked during our 11 days on the island. We even made tests with VE1CR, 170 miles away, in Sydney, N.S., without luck.

"We shut down on September 4th and returned to Nova Scotia the next day. Passing through Halifax on the way back, I met a number of hams who had heard of the expedition, and were curious as to our v.h.f. results. They said that a lot of weak signals issuing from the States were heard on the 31st of August, but too weak for identification.

"Perhaps we've at least stirred up some v.h.f. man with bigger and better equipment—and conditions—to make the trip in the near future!" (Maybe so, "Sandy"; at least you've set another example for determination and patience for other expeditioneers! Thanks! *—Ed.*)

Our Neighbors

VE3DER, Iris Weir, Toronto, reports that the 6 meter gang came to the rescue with three 6-meter mobile units to report aircraft race results when the 75 meter mobile group was indisposed at the last minute. The papers gave the boys a nice write-up. The usual drop of activity in the early months has affected the Toronto area, according to Iris. Everyone is busy with something, from TVI to moving. The VE3BOW tribe is busy getting settled in the new home near Hamilton and nothing has been heard from them.

VK3CR, J. K. Ridgway, is editor of "*Fifty Megacycles and Above*" in "Amateur Radio", published in Australia. In the September, 1951, issue, VK2CR describes considerable activity and interest in their 576 mc band. VK2RQ, 2HO, 2XX, 2DF, 2JU, 2AWZ and 2AET are all active. "With all the new stations starting on 576, it is like 20 metres!" comments VK3CR. Of the v.h.f. bands, however, 144 mc is most populated.

VK3ABA, James O. Bail, 60 Shannon St., Box Hill North, E. 12, Victoria, Australia, is *still* looking for a copy of the July, 1950, issue of "*The VHF News.*" If you have one, please let him know.

In The Midwest and South

W9EQC, Aurora, Ill., finally caught up with "Ol' Smoke", W8EP, Terra Alta, W. Va., on October 25, for state number 18 for Dick. W8BAX,DNO and DDO were also worked. . . . W9FAN, Sheboygan, Wisc., got his first Minnesota QSO on October 24 when he worked W0BBN, Grand Marais, Minn. W9LEE assisted. W8MRK, Muskegon Heights, Mich., now has a 16-element array and turns it towards Chicago quite often. . . . Novice station WN9OVL, Hammond, Ind., gets out quite well. WN9OKF, Park Ridge, has been at home in a cast for several weeks but is scheduled to re-enter Wesley Memorial on or about the New Year! While home, Leo used the TV antenna, unrotatable, for two.

W9EGH reports that there are 11 stations on 2 in Jackson, Michigan, with 3 more expected to be on by January. . . . Conditions of November 5th produced very strong signals in the Chicago area from W9ZHL, Terre Haute, and W9FPD, Danville, who worked W9EQC and others. . . . After long absences from two, W9LVK, Kenosha, Wisc., and W9ODT, Lockport, Ill., are back on, as is W9WFF, Frankfort. . . . Novice station WN9OKR, Chesterton, Ind., has put that town back on the two-meter map; used to be quite a bit of activity, there.

W9ZKD still supports Springfield activity; wha' hoppen to EHX and company? W9HKQ, De Motte, Ind.?? W9JGA, Morton Grove, Ill., was happy to work W0EMS, Adair, Ia., on October 27. W9UCH, Ft. Wayne, Ind., has maintained schedules with W9EQC nightly at 8:45 p.m. W9PK has returned to the band in spite of a night-time job! W9VNW, using a 522, is now to 2 and does a good job. . . . Active in the Chicago area: W9s CX, UMD, NW, KCW, GDM, WN9OKF, JGA, KDX, IMQ, CEW, DPY, EQC, NZ, DRN, IWE, IRE, WN9PVK, W9NFK. On 420 mcs., W9UMD, IWE and AYM.

W9LEF, Valparaiso, Ind., has been inactive cause of the illness of his young daughter. We hope for the best. OM. . . . The third annual VHF Ragchew was held at W9FVJ, according W9FKI. W9s SUV, LIR, IAW, GHZ, FKI a families enjoyed a fine repast. The LIR-FKI mob on 2 provided communications en route. It is ARC-3 transmitter, 6J6-HFS receiver; a PE-103 a vibrator powers the rig. The antenna is a 4-elem horizontal, mounted 40 inches above the top of car. "A" frames mounted on a luggage carrier provi support. Tests show reliability of contacts up to miles in spite of turns in the road; with the a tenna directly at the desired station, several 75 m contacts have been made.

In the Mishawaka—South Bend area, W9EC EKK, CMW, FME and IGH are all active on sp frequency FM, vertically polarized. ECH, EKK a CMW operate on the local frequency of 147.8 m while W9IGH and FME operate on 147.5 and ha frequent contacts with W9UDD, Ft. Wayne, and t Chicago area gang. W9QBH/9, Purdue, is activati W9SAR and others. New to the FM "*Party Li Net*" in the Chicago area; W9UZ, W9UDT. W9DX will be on, soon. The net has had several re emergencies to handle, the latest being the case W9LLZ's XYL. She suffered a relapse shortly aft returning home with her new daughter, and—sin there was no phone available—W9LLZ called f help on 147.5. A doctor was at the home within 2 minutes and Mrs. Carson was in the hospital with *another* 20 minutes! W9KLB, Chicago, and W9KJ Western Springs, had been monitoring and KL had the phone number for the local 24-hour medica emergency service!

WN5TFW, John Naff, Port Neches, Texas, re ports "about normal" activity, although condition appear to be somewhat down compared to those last year. W5DSB has been inactivated by moving QIO works MKP and EVQ, Baton Rouge area almost nightly. JBW, Maplewood, La., has been o vacation. QIO, Beaumont, Tex., has the crystal controlled converter working nicely. . . . The Octo ber 5th wide-area opening on 2 hasn't been equalled so far, this winter. W5s DCV, MIL, EVQ, MWW FBT, AYU, AJG, UW, JBW, QIO and QME were active. . . . The Gulf Coast Emergency Net, on 2-meters, continues active although Port Arthur sta tions have been quiet. Night school takes up W5DFM's spare time.

W5FSC, Houston, caught a 6-meter opening on October 24 and worked W3PCB, W8LPD, W9ALU W9EET and W0AEH. Heard: W8s CMS and NQD. Duration was 1850 to 2030 CST. Bud reports 2-meter activity has been hampered by the cold weather inasmuch as several stations are in outside shacks. Working-radius seems to be down to about 250 miles, now, according to WSFSC. . . . W5FEK is still working on his 2-meter mobile. W5IRP is busy with medical school. W5JTI visited the Houston area and was welcomed warmly. (They *do*, don't they, Tim? *—Ed.*)

And, In Closing . . .

I repeat the *standing invitation* to all of you to send in activity reports so that more compre hensive coverage can be given, here. Also, we'd be happy to have your *pictures*—the beam, the shack yourself,—and your *articles* on v.h.f. beams, equip ment and gadgets! *—73, W9NFK*

MOBILE CORNER

Conducted by RALPH V. ANDERSON, W3NL*

THIS EDITOR HAS HESITATED, in the past, to pass on to the gang any of the current crop of noise limiters using more than one tube because ost of them were critical in adjustment and were ifficult to get working properly. Here, however, is two-tube noise limiter which I have found to be e most effective of all limiters tried, yet is not y more critical than the usual single tube noise-miter. It has worked excellently on each occasion has been tried.

In operation, both grids of the dual triode tube eceive bias variations at the rate of the audio fre-uency. The plate current of section B of V-1 varies t the audio rate and is coupled to the cathode of ection B of the limiter tube V-2. The plate current f section A of V-1 varies at an average rate due filter components C-1, C-2 and R1. The plate load-ng resistors R-2 and R-3 are chosen so that with no udio excitation from the detector, the positive volt-ge on the plate of section A of V-2 is slightly higher han the positive voltage on the cathode of section of V-2 resulting in a current flow through the miter tube. Since the plate of section B of V-1 is oupled to the cathode section B of V-2 an audio ignal is obtained from the output of the limiter ube, V-2. If a noise impulse with a steep wave front s received, the grid of section B of V-1 will be riven more negative which will cause a rise in plate oltage in section B of V-1. The cathode of section of the limiter tube V-2, being connected to the plate f section B of V-1 therefore, is driven more positive han the plate of section A of V-2 and the current ow through the limiter tube is interrupted causing hole to be punched in the signal. While the grid f section A of V-1 receives the same impulse as the rid of section B, the plate section A does not follow e noise impulse due to the time constant of the lter components C-1, C-2 and R-1, therefore the late of section A of limiter tube V-2 does not re-eive the noise impulse in phase with the cathode of ection B of V-2, however, the noise impulse is coupled the plate of section A through resistor R-4 and apacitor C-3 and arrives out of phase, which tends lower the positive plate potential thus aiding in eversing the polarity between the plate of section and the cathode of section B of limiter tube V-2. ince the plate potential of section A of V-1 varies an average rate directly proportional to the rength of the incoming signal, the noise limiter reshold is automatically set and the limiter is effective on all values of modulation. The output is coupled to the grid of the driver tube by capacitor, C-4.

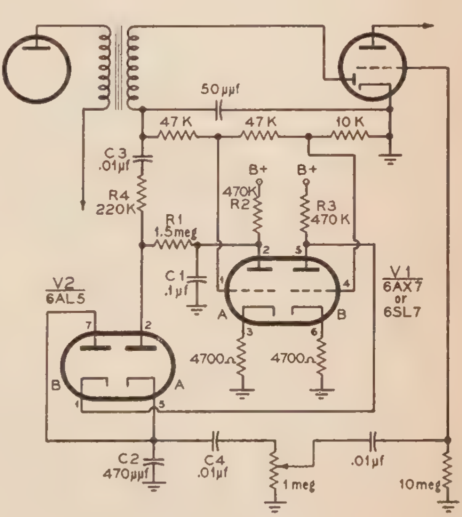
Automatic volume control is provided by a separate circuit, obtaining the a.v.c. voltage from the plate of the preceding i.f. tube, thus isolating the AVC and the noise limiter circuits. A variable resistance can be substituted for the plate resistor R-3. Adjustment of this resistor will provide a semi-squelch action which is quite effective for mobile operation.

Identification

Judging from the correspondence, hams want identification of mobiles. A couple of issues ago it was suggested that hams identify the mobile station with call-letters displayed either by decals or the aluminum call-letter plate above the license plate. Now, from widely separated points, comes many suggestions that a band identification be employed.

The main point of the discussion is the "missed QSO's." One mobile meets or passes another on the

(Continued on page 57)



Improved noise limiting performance may be obtained when a two tube circuit is employed. It will also act as a semi-squelch if R3 is made variable.

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end contributions to R. V. Anderson, 2509 32nd ., S.E., Washington 20, D. C.

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The Newcomer's Buyway

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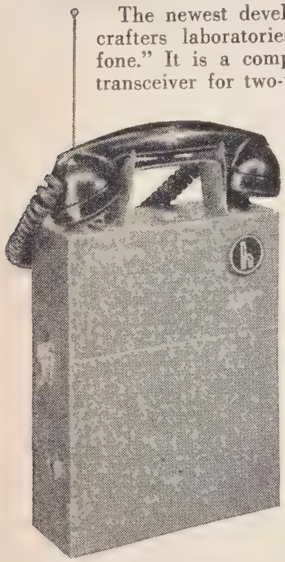
"Littlefone"



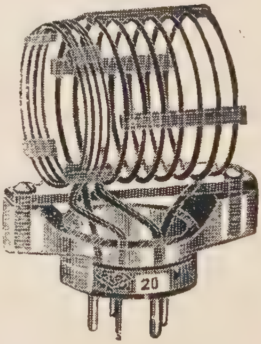
The newest development from the Hallicrafters laboratories is called the "littlefone." It is a complete self-contained FM transceiver for two-way Communication..

Model HT-21 can be crystal controlled in the band from 25 to 50 mc. It has a full two-watt antenna output. Model HT-22 is designed for the 150-174 mc band. Both units weigh about 14 pounds and are easily hand carried. The batteries are either dry, or wet—the latter being rechargeable from a car battery or 117 volt power line and rectifier.

A "central station" is also available with the same performance and specifications as the "littlefones." It operates directly from the a.c. outlet and has its own antenna.

The possible uses of "littlefone" easily challenge your imagination. If your work calls for a rugged, dependable radio-telephone remember the Hallicrafters Co., Chicago 24, Ill.

75 Watt Plug-in Coils

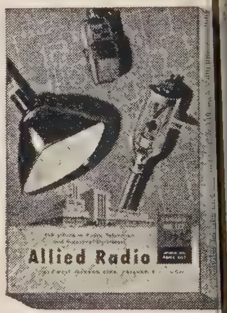


The Novice will soon find that he can depend upon products that have been "proven best by test." The Bud 75 Watt transmitter coil with Polystyrene Base gives you improved performance, better appearance and long lasting quality. Polystyrene has proven superior to porcelain for many reasons, including far greater resistance to breaking or cracking—the Q of the coil is exceptionally high due to the extremely low power factor—pins are moulded in place and always remain perfectly aligned—sharp corners are eliminated, no danger of chipping—transparency adds to smooth, modern appearance.

Bud 75 watt coils are furnished with fixed or adjustable center links and fixed or adjustable end links. They are air wound, mount into 5-prong tube sockets and can be used on bands from 6 meter to 160 meter. Some are designed for use in circuits using Pentode tubes with high output capacity. See the complete Bud line at your local distributor.

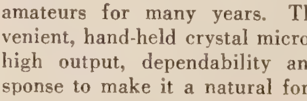
Allied Catalog

In amateur radio, a new youngster is affectiona called a "Young Squirt." We'd like to say a words to the Young Squirts, (and OM's), read this. In ham radio there are all kinds of gadg accessories and essential parts to be bought. Yo acquire some of these items as soon as you start build your equipment. Others you'll only "look for years. However — before you buy anything think of Allied's complete, free catalog.



Here is the new, complete Buying Guide to *everything* in Amateur Radio. It's ALLIED's 212-page 1952 catalog—packed with full selections of quality receivers, transmitters and station gear of every description—everything you need to operate an efficient Ham station at lowest money-saving cost. Here, too, are the widest selections of parts, tubes, kits, tools, books and diagrams, ready for fast, dependable shipment from ALLIED's huge stock. You can count on ALLIED for expert service, th most generous time payment terms and down-to-eart practical help from our large staff of old-time Hams Have the complete, dependable service enjoyed b thousands of Amateurs over the past 30 years. Send today for your FREE copy of the new ALLIED Catalog, finest Buying Guide in Amateur Radio. ALLIEI RADIO CORP., 833 W. Jackson Blvd., Dept. 16-AA-2 Chicago 7.

The Turner 20X

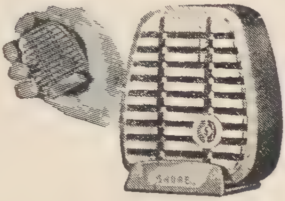


Nearly every Novice faces the problem of setting up his first rig with an eye toward equipment quality as well as economy. When you choose a Turner 20X Microphone, you make no compromise on either quality or economy—that's why the Turner 20X has enjoyed the popular approval of radio amateurs for many years. This light-weight, convenient, hand-held crystal microphone has the design, high output, dependability and unusually fine response to make it a natural for the ham.

The Model 20X (illustrated) lists at $12.85, while the S20X, which has a built-in push-to-talk switch, lists at $14.85. Both microphones have output level of 52 db below 1 volt/dyne/sq.cm, response of 60-7000 c.p.s., and die-cast metal case with rich bronze metalustre finish. For more information see your Distributor or write THE TURNER COMPANY, 929 17th Street, N.E., Cedar Rapids, Iowa.

The Newcomer's Buyway

The Hercules"



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1951 CQ World Wide DX Contest

The third CQ World Wide Contest is over and the logs are rolling in. We've rounded up a few scores which might give you an inkling of what the final and official totals will look like. The following scores surely represent a very small minority and it was uncertain in my mind whether we should even print them. However, after sounding out a few boys they seemed to think it would do no harm. This 1951 affair was favored with generally better conditions than existed in 1950. On November 3rd 10 and 20 were open for many globular spots. Certainly there was better participation than in 1950 and now if we can eliminate "disturbances," future W.W. brawls should prove to be quite something.

I'd like to point out that none of the scores listed are official and changes may be found in the final tabulations. The letter and numerals following the scores are keyed thus: "A"—**All Band**; "14"—**14 mc**; "S"—**Single operator**; "M"—**Multiple operator.**

Tentative Scores

CW

W2WZ	145,888	A-S
W3JTC	62,700	14-S
W3JYS	59,000	14-S
W4KFC	199,000	A-S
W4ESK	174,000	A-S
W4TO	39,000	A-S
W4JDR	8,500	A-S
W6MVQ	122,958	A-S
W6AM	103,000	A-M
W6DFY	105,000	A-S
W6BAX	80,000	14-S
W6QDE	18,480	
W6WB	24,500	14-S
W6ATO	34,450	A-S
W6CYI	82,000	14-M
W6FOZ	55,000	14-S
W6IBZ	43,700	14-M
W6QD	25,143	A-S
W6SR	22,869	
W6ENV	42,850	14-S
W6SRF	33,800	14-S
W7DL	101,000	A-M
W7GUI	15,000	14-S
W8JIN	195,000	A-S
W8ZY	141,000	A-S
W9RQM	83,000	A-S
KL7UM	26,500	A-S
KP4JE	24,400	14-S
KV4AA	111,000	A-S
GM3ZV	66,650	A-S
ON4QF	117,000	A-S
VQ2AB	119,000	

PHONE

W2WZ	11,328	14-S
W4ESK	134,700	A-S
W6RRG	70,064	A-M
W6AM	58,200	A-M
W6PYH	20,000	14-S
W7DL	18,147	A-S
W8JIN	57,105	A-S
W8GOB	13,570	14-S
W9RBI	35,840	
KH6MG	45,590	A-S
KL7UM	4,300	A-S
VE3KF	16,472	14-S
VE7NM	6,320	A-S
CO6OK	4,046	28-S
KT1DD	8,244	14-S
LU8CW	74,400	A-S
MD2AM	209,802	A-S
ZC4XP	49,840	

◆

Chief MARS and part of his staff are sho watching the traffic roll in on MARS teletype equi ment. Fifty-two messages in less than 60 minut have been handled indicating the excellent traf handling capabilities of the teletype facilities.

Shown left to right, are Capt. Walter S. Brown Jr., Asst. Chief MARS, Cpl. John Kennelly, high spee c.w. operator, Major Charles C. Mack, Chief Air Forc MARS, and Cpl. Norman K. Hester, non-commissione officer in charge of Headquarters Air Force MAR station maintenance.

◆

Air Force MARS Teletype Operations

AIR/K4AF is now operating FSK teletype daily on 7635 kc, 1000 to 1100 hours and 1600 to 1700 hours EST, Monday through Friday. AF2AIR, AF8AIR, and AF2EMS are reporting in regularly. Last month's *CQ* cover contained a photo showing the USAF Director and Deputy Director of Communications taking a direct interest in this facility. The Air Force Chief MARS, Major Charles C. Mack, states that because of its training value and ability to handle traffic under marginal conditions primary emphasis on traffic handling will still be by c.w. (A-1 emission). However, the training possibilities through the use of teletype techniques should not be overlooked. Further, the traffic handling capabilities o teletype must be utilized to facilitate the processin of the huge volume of traffic being handled b MARS. The Chief MARS has taken action to obtai clearance for use of additional MARS frequencie for FSK emission and approval should be forthcoming within the next few weeks. FSK clearance o frequencies used for individual member nets wil permit those individual MARS members intereste in FSK operation to operate teletype on MARS teletype nets being established.

▷ SPARE PARTS ▷

160 Meter Tests

Don't forget that four more 160 meter tests are scheduled. These are due on the following Sundays: January 6 and 20, February 3 and 17. W/VE stations will call CQ/DX from 0500-0505, 0510-0515, 0520-0525, etc. All DX stations will call 0505-0510, 0515-0520, 0525-0530, etc. That is, stations will call alternately every 5 minutes and listen for 5 minutes unless contact is established. All W stations are expected to use frequencies between 1800-1825 kc and 1975-2000 kc. G stations will use 1775-1795 kc.

So far this year we understand that W1BB and W9CVQ have been heard by ZL1AH. GW3ZV has worked ZL1AH and GW3FSP has been heard in ZL.

The station in the accompanying photo is "Clarry," VE1EA. This photo was recently taken by W1BB. The transmitter ends with a pair of 810s in push-pull. The antenna is a 133 ft. Zepp. The location of VE1EA is surrounded by salt water or salt marsh. VE1EA made the first contact on 160 meters between the North American Continent and Asia when he worked HZ1KE last year. Clarry is the watchdog for the 160 meter tests. When the band starts to open up and the signals roll across the North Atlantic, he hears them first and starts calling and working them. This is the tipoff for the W stations who then spring into action.

All participants in the 160 meter tests are urged to submit their results and logs to either Short Wave Magazine, 55 Victoria Street, London SW1, England or to W1BB. Special logs and reporting forms are available from W1BB. *—W1BB*

"Clarry," VE1EA, Box 384, Windsor, Nova Scotia, one of the foremost 160 meter DX men in the world.

Scotty Says

Merry Christmas and a Happy New Year from the gang at Lafayette! In this, and future ads, we will highlight products of nationally known manufacturers available at Lafayette. This month we feature the transmitting equipment of Harvey Wells and Barker and Williamson, as well as the very excellent pocket meter by Triplett. Down there on the bottom of the page are a couple of good bargains . . . Our supply of both is limited — so send your order in early . . . send it to my attention. 'Til next month — "73."

Duncan Scott, W2LAL

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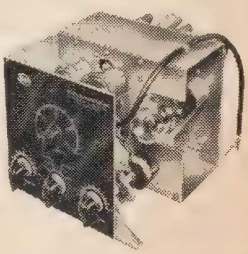

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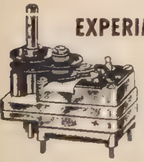

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Anent FCC Docket 10073

In the December issue of CQ we were able to insert a large part of the essential material in Docket 10073. To those of you who read it carefully, it became immediately obvious that the FCC was requesting opinions and comments from the individual radio amateurs as well as the organizations.

The material below was sent to us by W3HZF, President, National Amateur Radio Council, Inc. We have abstracted the NARC views on the basic issues and have printed their "Additional Comments," in toto, inasmuch as they are of interest and may influence the future of amateur radio.

The viewpoint of the NARC on the seven basic issues may be summarized as follows:

1. *F-1 emission on all bands in order to permit it to seek its own level.*
2. *No adverse effect on 40 meters with F-1.*
3. *Make available the entire 40-meter band.*
4. *No adverse effect if A-3 were used between certain frequency limits.*
5. *Recommend 7200-7300 kc as the most suitable.*
6. *Some interference, but probably less than 10 per cent of the time.*
7. *Operation should be authorized for all classes, except Novice and Technician.*

—Editor

Additional Comments by the NARC*

The Commission has not raised the phone versus CW issue in the present proceeding. Such an issue is likely to be raised, either directly or indirectly, by the American Radio Relay League, and National Amateur Radio Council has this to say:

The **present rule**, which makes no provision for A-3 emission, **does not meet the test** of public interest, convenience or necessity. It is unjustly and unreasonably restrictive, and it is discriminatory. The rule is of long standing, and the National Amateur Radio Council does not criticize the Commission for having the rule on its books. The Commission can very well say that when its rules are in need of overhaul it is up to its wards to speak up and say so. NARC now "says so," and warns the Commission that it should be on its guard against unrealistic overtures from the small, selfish group which has successfully presented narrow, self-serving recommendations in the past.

A-3 emission should have been authorized in the 7000-7300 kc band **years ago.** Prohibition of A-3 emission in this band is a departure from allocation practices already established, for A-3 emission is authorized in all other amateur bands. The present allocation for the exclusive use of A-1 emission on 40 meters does not tend to a **fair, efficient** and **equitable** distribution of facilities among amateurs, nor does it recognize the wide interest in communication which the Act anticipated.

The present rule denies the public the use of a **vast system of radiotelephone communication** by amateurs in time of emergency and disaster. If the NARC petition is granted, a vastly **increased area** of the nation can be served in time of need by providing a **better communication medium** to a greatly increased number of amateurs who prefer and use radiotelephony, the **most effective** means of communication during disaster.

Such a grant **would not impair the ability** of any amateur operator using A-1 emission to operate in the public interest, nor would the fair and efficient service of present 40 meter operators be curtailed. Such a grant would tend toward the establishment of an **equality** between A-1 and A-3 emission users in the amateur service. Such equality is very much needed.

The basic criterion for judging the issues in Docket 10073 is public interest. **Phone operators** have repeatedly demonstrated a **superior sense of public responsibility** and have given an **overwhelming response** in emergencies. Because of this, the Commission **may safely entrust** a share of the 40 meter frequencies to them—despite polls or self-serving recommendations of private corporations which prosper in the publishing business.

In adopting a proper evaluating standard in allocation practice for amateur radio, the **demonstrated value of radiotelephony during emergencies** should furnish a suitable criterion. For this reason, **priority** in making sub-band allocations should be given to A-3 emissio Traditionally, old-time telegraphy **must yield priority** consideration to radiotelephony in frequency allocatio

In allocating frequency bands to amateurs, whi heretofore were open only to CW, incidental deletio and changes for CW alone are inevitable, because pho has repeatedly furnished the most comprehensive disast service.

The State Council of Civil Defense for the State o Pennsylvania has this to say about radiotelephony:

> "Civil defense authorities feel that they will require more radio operators than we can hope to supply from our amateur ranks. Thus we hams will act more as commercial operators setting up equipment, servicing, and instructing civilians in its operation. For this reason, there is now very little consideration being given to CW operation. We do not at this time want to argue the point of CW vs. phone operation. Certainly, civilians will not be able to operate CW rigs."

Wide experience has shown that **radiotelephony** i **most likely to provide the best all-around service** to th public in time of emergency. Thus, the use of A-3 emission in the 7000-7300 kc amateur frequency band shoul provide additional benefits to the public by serving th greatest number of people.

Evidence of the reasonableness of the National Amateur Radio Council petition for A-3 emission on 40 meters can be supplied in a formal hearing. If such evidence is necessary, NARC requests that such formal hearing be held: however, NARC believes that such evidence is otherwise available to the Commission.

Public necessity calls for the most widespread and effective amateur service possible, and this can best be accomplished by **removing present restrictions** on A-3 and F-1 emission in the 7000-7300 kc amateur frequency band, and by opening it to all qualified operators. A-1 emission in this band **does not constitute the most satisfactory use** of this band under present conditions, from either an amateur or national point of view.

The Commission will not wish to simultaneously maintain two standards of allocation practice for two widely used forms of communication; i.e., A-1 and A-3. The CW operator holds no vested right to 40 meters. The CW operator holds no basic exclusive right to the use of **any** amateur band, **nor the right to protection from interference from other amateur stations.** If he did hold such "rights," he has lost them by his recent forfeiture of **a** part of our most valuable amateur band to the Russians and "commercials." Whatever the past policy at FCC may have been, there are **no clear and sound reasons of public policy** which justify a continuation of the present **ruinous, closed-door policy** for CW—only on 40 meters.

The NARC petition **affects the privileges of over 70,-000 amateur** operators, and **extends new privileges to nearly all.** The wishes of phone operators are, in themselves, an element of reasonableness, and the petition is surely in harmony with Section 303(g) of the Communications Act to "generally encourage larger and more effective use of radio in the public interest."

There is a **compelling public need** for emergency radiotelephone communication on 40 meters. The public will support such a communication request. It would frown on acceptance of "squatters' rights" by the Commission, particularly under present conditions.

Request for Special Temporary Authority

National Amateur Radio Council, Inc., requests that special temporary authority be granted immediately for all holders of at least General and Conditional licenses to use A-3 emission on a full-time basis in the amateur frequency sub-band 7200-7300 kc, until such time as a decision is reached on NARC petition under consideration in Docket 10073.

Two important things will result if the requested temporary authority is granted:

1. The public will receive maximum safety benefits in emergencies.
2. U. S. amateurs who use A-3 emission will occupy and use the portion of our most valuable band, which U. S. amateurs who use A-1 emission have abandoned to "Radio Moscow," and other propaganda stations.

**These views are those solely of the National Amateur Radio Council, Inc. and do not necessarily represent those of CQ, its staff, or publisher.*

N.tional Amateur Radio Council, Inc., is confident ıt the Commission will not prohibit amateurs from ng the one type of emission with which the amateur n successfully make use of his frequencies, nor does ARC believe that the Commission desires the propagan- from "Radio Moscow" to continue unopposed in our ıateur Lands.

National Amateur Radio Council, Inc.
Lewis B. Gilmer
President,

ecember 1, 1951

MOBILE CORNER

(from page 51)

ghway. If these mobile operators could tell instant- at a glance, the call of the other fellow, and the nd that he worked, a QSO would instantly result, en though it might be a cross-band contact.

Suggestions for indicators center about the stand- d color code—brown for 10, red for 20 and violet r 75 (or possibly gray for 80). Some suggest the lor be displayed at the base, others on the whip. ultiband stations would change the color with the ange in band.

These suggestions seem to possess considerable erit. While there has been no standard adopted, is suggested that each mobile operator should dis- ay some indication of band worked. Those working n exclusively should indicate the band used since any 20 and 75 meter mobiles use an internal load- g coil, and the absence of a loading coil does not cessarily indicate 10 meter operation.

Two and 6 have been left out of the suggestions re- ived thus far. Two should be self evident because of tenna length and 6 could be indicated by blue. Your comments and suggestions would be appre- ıted.

e Egyptian Radio Club.

Meet the Egyptian Radio Club. A lot of hams have rked members of the Egyptian Radio Club since was organized back when ham radio was just be- nning. The club is pretty well known since it used publish the "*Podunk News*" which went all over e world. Present membership is 65. The member- ip is limited. The club has a nice clubhouse and lot of radio gear. The station call is W9AIU and r general operation with the Mobile Communica- ons Corps of the club uses 750 watts to a uni-pole tenna on 10 and 700 watts on 75 meters. There e 50 to 60 mobiles operating in connection with the ub and coordination methods have been established th police and the Red Cross. Emergency coordina- rs for the area are W9THB and W9DJG.

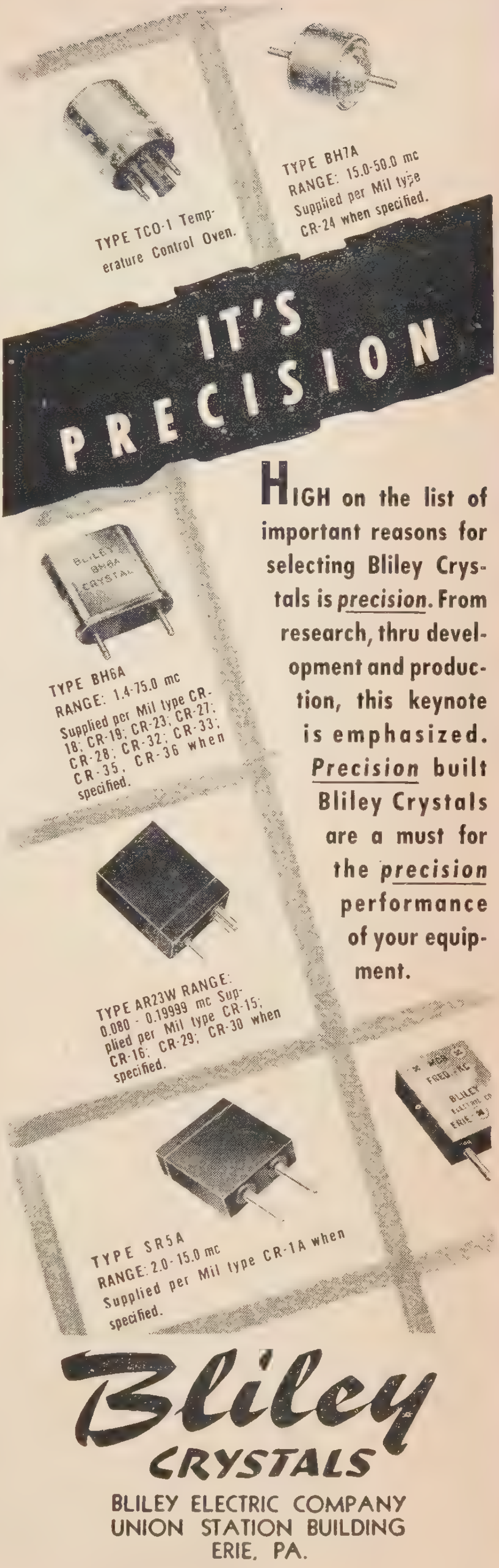
The clubhouse is located at 700 S. Choutreau ough Road, Granite City, Illinois. Mail address is x 320A, R.R.1.

aritime Mobile Amateur Radio Club.

Fixed stations: Send your 30 MM QSL's to W3OB, Maritime Mobile certificate.

The MM's are still having a tough time with their O's, being confined to ten, and no comments are eded on how lousy ten has been. Quite a number of ntacts are made though, in spite of bad conditions. any of the fellows are taking advantage of the ct that they are no longer Maritime-Mobile when thin the 3 mile limit and are thus able to work her bands.

The MM club prints a fb bulletin and a series of ticles on weather have been included in recent sues. Any of you interested in weather may obtain



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TYPE AR23W RANGE: 0.080 - 0.19999 mc Supplied per Mil type CR-15; CR-16; CR-29; CR-30 when specified.

TYPE SR5A
RANGE: 2.0-15.0 mc
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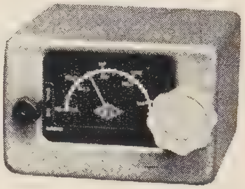

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a copy from the Secretary, W3OB. Last issue ha fb article on Hurricanes.

Any ham hankering for a trip on the deep bl remember that MM operators are needed quite bac and certain license regulations have been softer up.

A few MM items: From the MM Bulletin: "If a of the MM's put into London, and get thrown in t bloody jug, Alex, G6KC, will be a good man know. (Alex holds an MM certificate.) He is Detective Inspector in Scotland Yard. Incidental MF2AA is quite a good man to know in Trieste the same reason. Bob is his handle and is a Ma in the English Army, and head of the Civilian Pol there." Now, I ask you, how do you go about findi these things out? O.K., so they tell you, but it cou be the hard way . . . Billie, the YL MM was recen worked by a number of the Washington gang duri her vacation . . . W2ALZ called us a few days ag No radio gear on the Ohio yet . . . We understa that W6YYT, Ady, is closed down temporarily . W3OZA is heard consistently since his run le him use the north-south ship frequently . . . Ma of the MM gang are temporarily QRT due to th vessels carrying military cargo. While thus employ no ham radio is permitted . . . No one has quite bee able to keep an up-to-date list of the MM's on th tuna clippers . . . Many of the MM operators we military reservists and have been called to active dut

Odds and Ends:

Ever notice the mast-head of this departmen The boat is quite representative of many of th mobiles operating this summer. W3PV is one particular who worked a great many stations fro Chesapeake Bay. He had quite a time trying to kee the boys from calling him MM which he wasn't, b cause he was within the 3 mile limit. He used th designation "mobile marine" . . . Auto-Calls have r cently been installed at Hampton, Va. and Richmon Va. Standard calls, 1234 for emergency and 1232 for test, are employed . . . A few more fellows ar now mobile RTTY, particularly on the West Coas . . . Excellent 6 points stepping switches for remot control of QSY are being advertised at a very reasor able cost. They work excellently . . . Has anyon tried 420 mc mobile? We'd like to know of it there has been anyone that has done it . . . If an of you fellows have a ten-point "miner" steppin switch you'd part with, "leave-us-know" . . . this item is holding up extension of the Auto-Call to many ad ditional cities.

DX & OVERSEAS

(from page 31)

have floored a less hardy soul, have not discourage Clyde who goes on to say that he now has officia permission to operate in Sarawak and Brunei an will try again this April. W0ELA was amazed b the lack of W signals during six evenings on the ai from VS6BO and VS6AE, a grand total of thre W's being heard, one, of course being W1FH wh had several QSOs. Thus operations at VS5 migh have been very discouraging as far as Ws were con cerned anyway. Clyde praises the heartwarming hos pitality of the following: VS6BQ, VS6BO, VS6AE VS6CG, DU1AL, DU1CE, DU1FC, DU1GI, DU1GT JA2KW and JA2OM.

A last minute item from FR7ZA via VK3CX ocates FH8AB on Huon Island about 170 miles orthwest of FK8???? FN8AD is chasing Zone 9, ee 14120 around 1000/1200 GMT. . . . PX1AA hows activity again 14080 1100Z and 3518 2200Z.

KV4AA will try a general QSO period for conributors on 14001.5 during January being on from 400Z to 0100Z daily, this may save the boys some ostage. If proving practical, such periods will inlude other bands and hours in the future as anounced in this column.

This hodge podge was dashed off hurriedly due o transfer circumstances and we hope to have a ittle semblance of order next time. Let's know what ou want gang . . . . we aim to please!! 73s........Dick

QTH COLUMN

W1AC	Yemen QSL to W2YEJ
VP2AF	Austin Slack, Coolidge Field Antigua, BWI.
FD8AA	De Nungy Box 185 Lomé, Togoland, Africa
FD8AB	ditto
F8AG	Ivan Pastre, Base Aviation, Bamako, French Sudan, FWA.
FY7YB	General Delivery, Uleta, Fla.
ET1TA	"Ernie" PO Box 32, Harbel, Rep. of Liberia, Africa
VP8AU	Jock Bowles, Customs Dept., South Georgia, c/o GPO Falkland Is.
D4AB	Tom Hall, c/o Post and Telegraphs, Takoradi, Gold Coast.

With deep regret we record the passing of W6WN, Art Arrigoni. Art was one of the Eimac gang and a typical DXer. His sense of humor and friendly attitude will not be forgotten.

s a reminder we again list "verboten" prefixes: AR, EP/EQ, FI8, HS, J, PJ, PK1/6 and OE. Exceptions to this are JA and OE Allied occupation forces. We understand that PJ will soon be cleared, if not already, and that PK7 may be worked. Credit for QSOs after Dec. 21st 1950 will not be allowed.

R. C. Spenceley, KV4AA

PROPAGATION

(from page 41)

occasion drop below 7.0 mc, but not below 4.0 mc. During periods of this type, no European DX will be heard on 40, but they may be coming through with good signal strengths on 80. So be sure to check 80 if the Europeans are not being heard on 40 at times when they normally should be heard.

There is the possibility, on very quiet nights, propagationally speaking, that 160 meters will open. Time of band openings should be the same as for eighty meters, but with much weaker signals.

SOUTH AMERICA:

As usual, DX conditions will be very good on these stable circuits. For day circuits the 10 and 20 meter bands will provide almost daily openings characterized by good signal levels. For night-time circuits the 40 and 80 meter bands will produce stable circuits to Central America and northern South America. Less favorable conditions exist to countries south of the equator because of the higher noise levels and ionospheric absorption associated with the summer season now at those latitudes.

AFRICA:

Ten meters to Africa is expected to open quite often during January, since most of these circuits will clear the auroral zone and its associated absorption. There is good possibility for openings to

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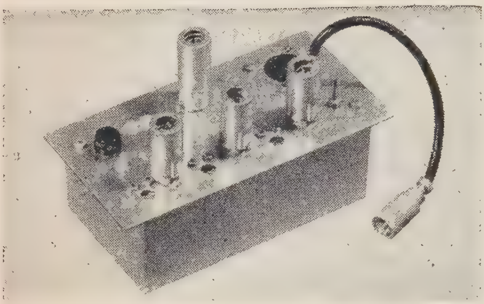

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the Pacific Coast as well as to the eastern and centr sections of the USA.

On twenty meters, North African signals should b heard at about the same time as the souther Europeans. The Central and South Africans sta coming in about the same time as the North Africa signals, but tend to have a mid-day drop out b-cause of the increased absorption on these longe circuits.

Forty and eighty meters are expected to be goo for North African paths during the all dark perioc with some 160 meter activity possible to the easter section of the USA. Conditions on forty and eight become progressively poorer as the circuit become more southernly and not too many openings ar expected to Central or South Africa.

OCEANIA (Australia and New Zealand):

These circuits favor those on the Pacific Coast. Circuits from the Pacific Coast to Oceania are expected to be very good on ten meters, but with hardly an opening is expected from Oceania to the central or eastern areas of the USA.

Fair to good DX conditions are expected on twenty meters, with band conditions very similar to those in late December.

Fair DX conditions are expected on forty meters, with some good openings on undisturbed days. As we approach the Equinox (March 21) conditions will tend to improve on forty and to a lesser extent on eighty. During January not much eighty meter activity is expected on these paths.

ASIA:

From the Pacific Coast of the USA to Japan and southeast Asia some ten meter activity can be expected. From the eastern and central areas of the USA it will not be until we are in the higher sunspot counts that these circuits will open on ten meters.

Twenty meters is expected to be good between the Pacific Coast and eastern Asia with some openings expected, on days of quiet ionospheric behavior, to the central and eastern sections of the USA.

From the Pacific Coast fair conditions exist for some forty and possibly some eighty meter openings. Infrequent openings to the central and eastern sections of the USA are also expected.

Propagation conditions are still very poor to India and central Asia. No ten meter openings are expected. There are some very infrequent twenty meter openings possible, but signal levels will be weak and characterized by flutter fading.

Propagation conditions to the Near East Asiatic countries are very similar to conditions described for the southern European circuits. In general, times for band openings will be similar, but signal intensities weaker. Some 10, 20, 40, 80 and possibly 160 meter openings are expected.

NOVICE SHACK

(from page 26)

complicated as the builder wishes, and there is no better way to increase one's knowledge of radio than building a receiver. Besides, there is an undeniable satisfaction in the mere fact of being able to do so. And lastly, where every penny counts, you can build a usable receiver for less than you can buy one, or for a given sum of money, you can put more features in a home-built receiver than you could buy.

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gnals.

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re that does not heal (2) a lump or
ickening, in the breast or elsewhere
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9-86T	86"	**3.60**
9-96T	96"	**3.75**

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8-86	86"	**3.42**
8-96	96"	**3.56**

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That even if "CQ" had the best staff in the world nothing enhances a magazine as much as unsolicited contributions? In "CQ" we try to put in the pep and sparkle that can only come from having our material written by many and varied sources.

This is a "cash" proposition. At the present time, an "average" full length constructional article brings about $50.00. The exact amount varies with many factors. But, you can always say—if it appeared in *"CQ"* it was paid for.

Have you a transmitter, receiver, antenna, or other item with a novel slant, perhaps not brand new, but one which would be attractive to fellow hams? Many of the most interesting articles come from fellows who fail to realize that they've "got something there." Why hide your light under a bushel?

(Note: To save you time and trouble we will be glad to comment on outlines of proposed manuscripts. We will not, however, commit or obligate ourselves to accept the final manuscript until we have had the opportunity to fully review it.)

Possibly, the most apparent difference betw home-constructed and commercial communicat receivers is that plug-in coils are usually used the former for band changing. They are just as e cient as band switching and simplify construct greatly. Another is the extreme simplicity of so home-constructed receivers. *Figure 3* is an examp Carefully constructed, its operation compares s prisingly well with more elaborate receivers for ceiving code signals.

Rather than devoting more space to home-bu receiving equipment, a bibliography of constructi articles appearing in *CQ* and other contempora magazines in the past year or so appears at the e of this column. The list includes simple or compl receivers and converters for almost all amateur ban

A warning! Several of the simpler equipments list use "hot-chassis" AC/DC power supplies, violati all safety rules. They are so potentially dangero that I hesitated a long time before listing them. do so, because they can be made safe by adding 35 to 50 watt isolation transformer between the a power line and receiver. If you value the life anyone (including yourself) who might come contact with your receiver, do not use the equipme so indicated without the isolation transformer. (S *Fig. 4*)

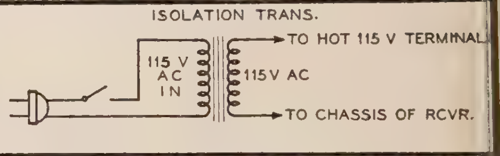

Fig. 4. Use of isolation transformer with "hot-chassis equipment.

A few items of general interest. Everyone concerned is amazed at the tremendous number of applications for novice licenses that have inundated th FCC. Personally, I am especially impressed by th number of women and girls who have received o are studying for their calls.

Did you know that when you go to the FCC office to take your examination, you can apply for Novice, Technician, and General Class licenses if you desire, and will receive those you qualify for? It works like this: Having applied for all three, you take the 13-w.p.m. code test. If you pass it, you are given the envelopes containing the written examinations for the General and Novice Class licenses. If you pass the General Class examination, you are in. Failing it and passing the Novice examination gives you a Novice class license.

Should you fail the 13-w.p.m. code test, but show any copying ability at all at this speed, you are qualified to take the Novice class written examination without taking the 5-w.p.m. test. And you can take the Technician class examination with no code at all. Pass both examinations, and you will get both licenses.

Possessing a Technician Class license, as soon as you get your code speed up, you can qualify for a General Class license immediately by passing the 13-w.p.m. code test.

See you next month. In the meantime, let me know your problems and desires. The only way this column will be a success is to make it interesting to you; so let me know what you are interested in seeing in it.

73, Herb, W9EGQ

BIBLIOGRAPHY OF RECEIVER CONSTRUCTION ARTICLES.

1. Clifford Paterno, W2PPT, "A Pint-Size Station." CQ, p. 28, August 1949. Receiver tunes 3.5 to 30 mc. AC/DC USE ISOLATION TRANSFORMER.
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3. John E. Stacy, W1KIM, "The Ultimate in Converters," CQ, p. 13, Sept. 1949. Additional notes in November issue. De-luxe VHF converter.
4. G. H. Floyd, W2RYT, "The Two-Meter R9er," CQ p. 18, Dec. 1949. Fairly simple r-f amplifier for increasing receiver sensitivity at 144-148 mc.
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6. C. R. Wade, W9HZZ, "Triple Conversion for the BC 348," CQ, p. 26, Nov. 1950.
7. W. M. Scherer, W2AEF, "Another Standard of Comparison," CQ, p. 11, Nov. 1951. A 4 to 144 mc de-luxe bandswitching receiver. Designed for mobile work, but will work excellently for a home receiver with the addition of a b.f.o. and power supply.
8. F. E. Ladd, W2IDZ, "A Bandswitching Converter for 144 to 21 Mc," QST, p. 22, April 1951. Advanced design.
9. Richard L. Baldwin, W1IKE, "A First Receiver For The Novice," QST, p. 24, August 1951. Simple 80-meter two-tube regenerative receiver.
10. Edward P. Tilton, W1HDQ, "A Bandswitching VHF Converter and Harmonic Chaser," QST, p. 43, July 1951. Building VHF converter around TV tuner.
11. Glenn H. Querna, "Midget Shortwaver for DX Reception," Radio-Electronics, p. 48, Sept. 1951. Battery-operated portable regenerative short-wave receiver.
12. Stan Johnson, W0LBV, "More Range For The SW Receiver," Radio-Electronics, p. 52, August 1951. Increasing sensitivity and selectivity of low-priced communication receivers by means of plug-in i-f stage and adding r-f amplifier.
13. H. J. Harris, W1PFF, "Ham Converter For 2-6-10-15 Meters," Radio and Television News, p. 48, Feb. 1951.
14. Alvin B. Kaufman, W6YOV, "Broad Band Converters," Radio and Television News, p. 38, March 1950. Simple h-f converters.
15. R. D. Bulkley, W2QUJ and M. Kirchhoff, W2FAR, "A 2-Meter Transmitter Receiver For Civilian Defense Operation," Radio and Television News, p. 45, August 1951.
16. Edward P. Tilton, W1HDQ, "A VHF Receiver for the Novice or Technician," QST, p. 33, Nov. 1951. Three tube super-regenerative receiver for 144 and 220 mc.

Also see Radio Amateur's Handbook and Radio Handbook, current editions for many other receiver converter construction articles.

SCREEN GRID

(from page 16)

megohm bleeds a little current thru the load resistor *R50*. This modulator gave good quality when modulating either an 829B or a pair of 4-125A tubes in the two meter band. With the 829B and a 750 volt supply, the quality was acceptable for an 829B plate current of 60 ma, no a.f., to 120 ma on speech. This unit would kick the plate current up to over 200 ma but the overloading was excessive. The 4-125As were linear on the scope pattern up to 250 ma of plate current and could be driven up to 350 ma with some obnoxious splatter and overloading.

Summary

The conclusions of nearly a year of tests on two meters of all kinds of modulators were that the controlled-carrier systems require the d.c. plate current of the modulated r-f stage to be driven up to 40 or 50% higher than the d.c. plate current of an equivalent steady carrier modulated stage.

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In other words, the higher input was needed to produce the same a-f signal at a distant two meter receiver. The "positive cycle" controlled-carrier signal quality is not as good as steady carrier screen modulation but is acceptable for voice communication. The controlled-carrier system needs a heavier power supply and the varying d.c. load current of a large transmitter sometimes reacts back on the main line voltage. One definite advantage on low frequency amateur bands of controlled carrier is a reduction of carrier heterodynes. The use of receiver noise between words and the lack of a steady carrier to tune for, are distinct disadvantages.

SCRATCHI

(from page 4)

Hole band is talking about it, and wondering how come TV stations now using ham band. One fellows are so steamed up he writing FCC about it. Another fellows are mad on acct. he can only heer TV station, and can't getting any pichoor. This last-named person are especials mad because he can't seeing sumbuddy called Quagmire, or some such name.

Howsomever, Scratchi figure that anything worth doing is worth trying again, in words of ancient philosopher One Lung Low, so again putting rig on air. Are having it on for long time while trying to figure out trubble. Thoughts are suddenly interrupted by jangling of door bell, and loud noises as man with large feet and small badge are crashing into room and grabbing Scratchi. Are being pulled ou door feet-first when Brother Itchi are calling hal and man releasing grip on me. Iron bars and padde cells, here I almost coming. Brother Itchi, than gracious to goodness, are demanding explanation.

Ossifer from long arm of law are saying he having orders from FCC to picking up Scratchi as emitting illegal signal on ham bands, said signal being rebroadcast of TV station. Itchi asking how come can doing this when we not even owning TV receiver (I are not needing to explaining why this are true, needing I, brother TVI sufferers under the skin?) Ossifer from local jalehouse are slitely uncoherent at this point, but he putting in telyphone call to local FCC office, and after short wate local inspecktor in charge are there and asking to look at radio shack.

I explaining how only trying out clamp too modulation with pair of old C clamps I having around, but FCC fellow are not seeming to heer what I saying. He looking at rig and eyes getting bigger and bigger. He are about to touching C clamps on final, when I remembering that rig are still on, so Scratchi quick pulling main switch before inspecktor in charge are being placed in charge of sum other territory by higher authority than FCC. All this time inspecktor are mumbling to himself, and what I heering sound like—"amazing, amazing .....magnetized C clamps, resonant to microwave TV relay. . . .magnetron action. . . .actually modulating final with TV signal.." or sum other equally tecknickly foolish words

Upshoots of hole thing are that FCC inspecktor are telling me to taking off C clamps, putting mike back where it belongs, and getting back on air in normal way, and he not pressing charges with

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poleeceman. I know it's hard to believe, Hon. Ed. From clamp toob modulation to rebroadcasting TV microwave relay in one easy lesson. Don't asking me what happened. This new-fangled stuff is too much for me. Back to my good old rig, just like the inspecktor said.

Say, Hon. Ed., when the inspecktor say I should be going back on air in normal way, you thinking he meant it was ok to put the five kilowhat final back in the circuit?

Respectively yours,
Hashafisti Scratchi

NOVICE TRANSMITTER

(from page 22)

500 volts, the pickup coil of L_2 should be adjusted so that the meter will read approximately 100 milliamperes. In no event should the current be allowed to go above 110 milliamperes or the ratings of the ube will be exceeded.

1 Meter Tuning Procedure

Tuning the 11 meter band is a bit more difficult, but if adherence is made to the text, there will be ittle likelihood of failure.

As was explained in the beginning of the article, 11 meter operation is attained by doubling in the plate circuit of the crystal oscillator, as well as in the 807 amplifier. A small absorption type wavemeter, such as the Bud Model WM78 or GX79 which has a small lamp to indicate r-f, is essential to insure that we are utilizing the correct harmonic. The wavemeter represents a very small investment and will find many uses in the Novice's "shack" and workshop.

In order for the transmitter to multiply to the 11 meter band, a crystal must be used that is in the frequency range of 6740 to 6800 kc.

With the 20 meter crystal oscillator and 10 meter r-f amplifier coils in their respective sockets and a crystal in the appropriate frequency range placed in the crystal socket, we may proceed with the uning operations.

We will use the same system of resonating the ransmitter as we did for 80 meters—with the pickup coil of L_2 connected to a 40 watt light bulb as a dummy antenna.

With the key depressed, touch the neon lamp o the "hot" end of L_1 while tuning C_5 for maximum brilliance.

The 807 may then be tuned to double to the 11 meter band; adjust the wavemeter to approximately 27 megacycles (just below the 10 meter band) and hold the wavemeter pickup coil near L_2 while uning C_{11} with the key closed. When an r-f indication is found we are certain that the correct harmonic is being utilized. The 807 is then tuned to the full minimum or "dip" as indicated on the plate current milliameter (*M1*).

nterference Elimination

In some areas where there is considerable television activity we may find that our 11 meter signal will cause interference to our neighbors' television ets. This is due to harmonic radiation from the

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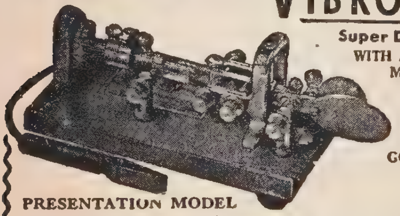

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807 amplifier stage. This undesirable form of inte ference may easily be eliminated through comple shielding of the transmitter to prevent the esca of this harmonic radio energy. This may be do by enclosing the transmitter in a metal cabin with dimensions approximately 12 x 8 x 11 inche All covers should be securely fastened and shou make good electrical contact. An additional saf guard, which we may employ to prevent harmon energy from escaping from the cabinet by way o the power supply leads, is the addition of sma harmonic trap circuits as shown in *Fig. 4.* As final and by no means unimportant harmonic elim nation procedure is to feed the output of the tran mitter from L_2 to a commercial low-pass filte such as marketed by Barker and Williamson, Drak or Eldico.

Much has been written regarding television in terference elimination and it would be impossibl to cover all means by which it may be accomplishe in this article. The various radio handbooks con tain much information although the simple mean just described will suffice in all but the most stub born cases.

In addition, many amateur radio clubs hav "Television Interference Elimination Committees" who will be only too pleased to aid the Novice t eliminate harmonic radiation and its often-trouble some television interference.

Antenna

It is necessary to mention here that this transmitter is designed to operate with either a half-wave dipole antenna fed with 72 ohm twinlead or coaxial line or a half-wave folded dipole antenna fed with 300 ohm twinlead. The latter will be found less costly and less complex to construct.

Simple antennas for 80 and 11 meters are sketched in *Fig. 5.*

Conclusion

A word might be added regarding the two amateur bands covered by this transmitter. The lower frequency 80 meter band might be termed a "short" to "medium" distance band. Reliable communications up to 150 to 200 miles can be achieved during daylight hours, while 1000 miles can be achieved at night. The 11 meter band is more of a "long" distance band, although it is affected by the seasons of the year; long distance communications being affected more readily in the summer-time than in the winter. Further, daytime operation permits long-distance communication more readily than evening. When conditions are favorable, many thousands of miles may easily be spanned using the frequencies in the 11 meter band.

Construction and operation of the small transmitter described here will enable the Novice to start his amateur career with an excellent communication facility. Once the Novice gets on the air he will, no doubt, be anxious to improve his code speed and perfect his operating technique so with a practical operation he may obtain his full amateur license at the end of his one year license term.

o those of you who are ready to buy (or even to sell), hese Reports will give you the latest price changes s well as the new and discontinued products. This nonthly summary of the market is supplied by RADIO'S IASTER, The Industry's OFFICIAL Buying Guide, pubished by United Catalog Publishers, Inc., New York ity. A complete description of each product is found n RADIO'S MASTER 16th Edition.

OOKS & MANUALS

ider, John F.—Introduced two new publications and Rider's TEK-FILE.

ams, Howard—Withdrew "The Recording and Reproduction of Sound."

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elden Mfg. Co.—Temporarily discontinued the following items for the duration of the present emergency; 8000-02, Bare Aerial Wire; 8008-09, Solid Beld Aerial; 8011-12-13, Solid Tinner; 8200, R.C. Lead-in-wire; 8235, 300 ohm (Heavy Duty) Transmission Line and 8782-83, Juke Box Cable.

ederal Telephone—Added complete new line of Selenium Rectifier Stacks and TV Replacement Kit No. 1 at $15.50 net and Radio Kit No. 2 at $8.75 net.

eneral Control Co.—Marketing No. A.C.O. at $10.00 and DU.OP at $1.90 net to their line of Switches and Controls.

ndustrial Condenser Corp.—Motor Starting Condenser MS 3324 reduced to $3.78 net.

ames Vibrators—Added ten new Communication Vibrators.

otter & Brumfield—Withdrew relays No. SM5DG and SM5LG while adding five new series "MT" relays.

uam-Nichols Co.—Added new line of 25 TRU-MATCH Output Transformers.

einer Electronics Co.—Advised reduction in price of Leads No. 5 Type Z and No. 7 Type Z to $9.95 net.

riad Transformer—Increased Input Geoformer G-2 to $20.08 net and added Filament Transformer F-18X at $4.14 net.

rimm, Inc.—Discontinued 26 items on their line of Headsets and Accessories, and also withdrew their complete "V" series of wire wound controls.

ECORDING EQUIPMENT, SPEAKERS, AMPLIFIERS, NEEDLES, TAPE, ETC.

ltec Lansing Corp.—Price increase on items in following categories of their line: Racks; Blank Panels, Transformer, Diaphram and Voice Coil Assemblies; Horn Throats; "Voice of the Theatre" Speaker System; Amplifiers; Low Frequency Horns; High Frequency Multicellular Horns (less speaker); Power Supplies.

uotone Co.—Reduced price of Shockproof Nylon Needle No. 25 to $10.50 net and No. 25M (Micro-Groove) to $8.75 net.

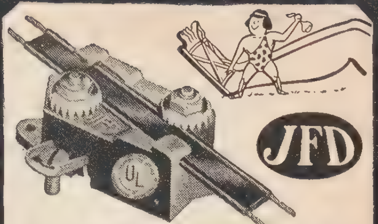
.E.—Added dual stylus assembly No. RPJ-013 to their line of phono accessory items.

ek-O-Kut—Temporarily discontinued Models T-12H and T-43H Dual Speed 12" Transcription turntables due to lack of materials.

ebster-Chicago—Introduced Wire Recording Album Model 2916 at $.60 Catalog price and reduced Nylon Phonograph Needles Model NE-37 to $.80 Catalog price.

EST EQUIPMENT

lectronic Measurements Corp.—Added Tube Battery Ohm



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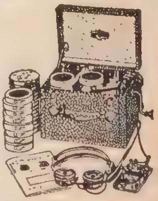

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CT-15A	350VCT	.070	6.3/.6,6.3 1.8.3 lbs.	2.95
CT-071	110V	.200	33/.200, 5V/10, 2.5/.10	4.95
CT-378	2300V		4MA 2.5/2	6.95

COMMUNICATIONS EQUIPMENT CO.
131 Liberty St., Dept. Q1 New York 7, N. Y.

and Capacity Tester, Model 204 at $55.90 and Vacu Tube Volt-Ohmmeter Model 106 at $35.90.

R.C.A.—Added Test and Measuring Equipment Types W 220, Direct Probe Cable; WG-291, Crystal Diode D modulator Probe; WP-25A, TV Isotop, Topped Au Isolation Transformer, and WV-77A, Jr. Voltohmyst.

TOOLS AND HARDWARE

Utica Drop Forge and Tool Corp.—Started producti again on Slip-Joint Pliers #7-10" and #8-10".

Van Cleef Bros. Inc.—Reduced prices on quantity pu chases of 30 and over for No. 10 Plastic Electrical Ta

TUBES—RECEIVING, TELEVISION, SPECIAL PU POSE, ETC.

G.E.—Now marketing Picture Tubes 17VP4, 20LP 21EP4A and 21LP4 while withdrawing five other T tubes. Also added GL-2B22 Industrial & Transmittin Tube, 6U8 Receiving Tube and reduced price of 6BF and 24AP4.

Hytron—Added Picture Tubes 17HP4A, 19QP4, 20HP4A 21EP4A and 21FP4A. Withdrew Special Purpose Tube 10Y and 864 while adding 5Y3WGT.

R.C.A.—Added Tubes 6BQ7 at $3.20 list; 6X8 at $2.65 an Kinescope 19AP4-A at $65.00.

Sylvania—Added 8 Rocket Tubes and 12 Subminiatu Tubes, also increased prices on all Subminiature Tube except 6AD4, 6BA5 and 6K4.

Westinghouse—Revised prices on 25 Industrial Replace ment Tubes and added Electronic Tubes WL-5934 an WL-5974.

YL'S FREQUENCY

(from page 45)

left lung. With nine and a half ribs removed and the lung collapsed, she has spent most of the rest of the time in bed. Then in '49 TB hit the right lung. An operation was impossible and serum injections gave a bad reaction. Pat had lots of courage but the going was rough. She joined every book club she could find and made leather purses and billfolds until she was exhausted. Then she hit an all-time low.

Searching frantically for something to take up her interest she turned to ham radio, bought a short-wave receiver and started listening to the hams. Among them were two good friends and former neighbors of Pat and her OM—W5NOW, Grace, and W5FLJ, Cliff Moorman. Grace and Cliff urged her to study for her ticket and Cliff promised to build her a transmitter. Soon in their QSOs every day they were saying hello to Pat until most of the hams in Texas knew of her and were sending her greetings.

But studying the code alone was tough and she was about to give up when W5GYW and other hams got her on the air in a round-table via phone patch. With renewed enthusiasm she buckled down to it with records, an Instructograph and on-the-air practice from interested hams. It was a year ago December that Pat got her receiver. In August she took the Class C exam, and received her license on October 4th.

That was a great day for Pat—and one of big excitement for the Parks' children, Deanna, 7, and Don, 12, who could hardly wait for mother to get on the air. W5FLJ and W5FQT with their XYLs, W5NOW and W5OLL, drove over to put up her antenna and fire up her rig. Operating on 160 with about 200 watts, W5TTU's first QSO was with W5RNM, who had greeted Pat earlier. Second contact was with W5RJI. Both of Stamford, they and their XYLs promptly drove over to Pat's also, and it soon became a small hamfest. By sundown Pat d talked to several other hams and joined the 0-meter Texas Emergency Net. Gratefully Pat ites, "This world of ham radio is wonderful— friendly and kind!"

And Pat feels like a new person now. "I'm going get well even if it takes another two years in d," she says, and adds, "I only hope my story ll help someone else—there are so many who need ith and courage to carry on."

Now Pat wants to join YLRL. Let's all drop her note of welcome. Just Rotan, Texas, will reach her.

* * *

Merry Christmas. Happy New Year, good DX and easant QSOs! Till next month, 73 and 33—*W5RZJ*

BCI AND THE BCL

(from page 23)

find some other way to keep out of my radio sides ripping it apart," I said, showing a little ger. "Maybe you'd better just stay off the air. here must be a law against guys like you who oil people's radio listening."

I turned around to see what he had to say and was walking out the door. The cord to the ldering iron fell out of his hand and the rubber ug bounced on the floor and trailed behind him.

"Where are you going?" I asked.

"Call the FCC," he said. He sounded tired— Complain to them."

"I will!" I yelled after him. "Don't think I won't." I knew my rights. I was no dummy.

So I sat down at the desk and adjusted the catswhisker on the galena crystal and listened to my radio.

PHONE PATCH

(from page 18)

satisfaction here more than covered the cost of the *patch* and toll charges involved for the long distance call. Since then many schedules have been completed with Asia, Europe, Africa and South America proving that you don't need a mousetrap or ten kilowatts for some good DX.*

---

* P. S. We were overwhelmed with schedules to use the patch and it became so time consuming that we sold the modulator and patch. From now on, call us on c.w.

MEN OF RADIO

(from page 38)

trated in *Fig. 3.* He evidently felt that his system was valuable for communication at sea, because reference to such an application appears several times in his patent specification. The invention was never used for that purpose, but it was used commercially for a while in communicating over short distances. Apparatus was installed on trains and at fixed points along the railroad right of way, so that travelers might communicate en route. There is

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CRYSTALS, Ham or Novice. Immediate delivery from stock. Mounted in FT-243 holders, ½" pin spacing. Novice 3700 - 3750 kc. "Ham" 1975 - 2000 kc, 3500 - 4000 kc, 7000 - 7350 kc, 8000 - 8200 kc. Your choice of frequency, plus or minus 5 kc. $1.00 each postpaid. Potter Radio, 1314 McGee, Kansas City 6, Mo.

WANTED: RA-34 rectifier, ART-13 sets, dynamotors cables, etc., TCS sets, dynamotors, cables, remote controls, loading coils, SCR-284, BC-654, PE-103, PE-104, GN-45, BC-221, BC-348, BC-312, BC-342. Test equipment, cash or trade. T. Clark Howard (W-1-AFN) 46 Mt. Vernon St., Boston 8, Mass.

TELETYPE HEADQUARTERS! Have several complete machines to trade for parts or units of models 14 and 15 teletypes; swap transmitters, facsimile, weather equipment for teletype and carrier current equipment; inquiries invited. Manhattan Electronics, 219½ south Sepulveda, Manhattan Beach, Calif.

TELETYPE EQUIPMENT: Whenever selling teletype equipment please get signed waiver saying equipment won't be used commercially and send copy to Amateur Radioprinter Society, 7560 State Road, Cleveland 29, Ohio.

GOING TO TRY for an amateur radio operator's license? Check yourself with a complete coverage multiple-choice type test similar to those used by the F.C.C. Surecheck tests with answer key, Novice Class $1.50, Conditional and General Class $1.75; Advanced Class $2.00. Order your time-tested surecheck test today. Amateur Radio Supply, 1013 Seventh Ave., Worthington, Minnesota.

ANTENNA rotator, powerful induction type motor, weatherproof, no interference, approx. ¾ RPM, built-in potentiometer for remote indicator. Use 110V AC with resistor cord or series lamp. Instructions included. $2.95 each, $5.00 pair, postpaid in U. S. Paul Swan, 2801 Ohio, Topeka, Kansas.

BARGAINS: New and reconditioned Collins, National, Hallicrafters, Hammarlund, RME, Millen, Gonset, others. Reconditioned S38 $29.00, S40A $69.00, SX71 $149.00, NC57 $69.00, NC173 $139.00, HRO5TA1 $159.00, HQ129X $139.00, HF-10-20, VHF152A, RME84, RME45, S53, SX43, SX42, SX62, SX28A, HRO7, HRO50, Collins 75A, others. Shipped on approval. Terms. List free. Henry Radio, Butler, Mo.

WANTED: RG-8-U, RG-11-U or RG-59-U coaxial cable, any lengths, any quantities. Write: Television Service Co., 249 North 48 Street, Lincoln, Nebr.

WANTED: Two "Telepatch" units as advertised by Allied Radio. Will pay original cost plus postage for units in good condition. Write Walter E. Smith Jr., Box 159 Koloa, Kauai, Hawaii.

500 attractive QSLs? SWLs? 2 colors only $2.75 sent C.O.D. Atlantic Printing, Box 346, Clifton, N.J.

W1JR on Mockingbird Hill. Fall house cleaning. Good surplus tubes and gear. No junk. C. C. Richelieu, 125 Dyer Street, Gardner, Mass.

DXers! "Ham's Interpreter"—ham words and phra translated into 7 languages—$1.00. For SWLs "World Radio Handbook"—complete information international stations—$1.50. "How to Listen"— SWL novices, 30c. World Radio Publications, 10 Connecticut Avenue, Washington 6, D. C.

BARGAINS: Extra special! Motorola P-69-13 mob receivers $29.50; Globe King $315.00; HT9 $199.0 SP400X $249.00; HRO7 $199.00; Collins 32M $99.50; Collins 75A1 $295.00; HRO-5T $175.0 Hallicrafters S-47 $109.00; RME-45 $99.00; Meissn Ex shifter; S-40A $69.50; VHF 152A $69.00; H 10-20 $59.00; SX-24 $69.00; Globe Trotter $79.5 Meissner signal calibrators $24.95; MB611 mobi transmitter $29.00; 90800 exciter $29.50; XE $14.95; and many others. Large stock trade-ins: Fr trial. Terms financed by Leo, WØGFQ. Write f catalog and best deal to World Radio Laboratori Council Bluffs, Iowa.

WANTED: BC-654A, ART-13, TCS, and their dyn motors, cables, control units accessories, parts. RA-3 rectifier, BC-348, BC-342, BC-312, BC-221, test equi ment. Arrow Appliance, 525 Union, Lynn, Mass.

TOP CASH for APR-4 units and parts; microwav test equipment, ARC-1, ARC-3, ART-13, etc.; TS-3 and other "TS-"; good quality laboratory equipment manuals, tubes, meters and parts. Will also trad TV, SX-28; VTVM, astronomical telescope, et Littell, Farhills Box 26, Dayton 9, Ohio.

WANTED: All types surplus aircraft and groun electronic equipment or parts thereof—all types. To dollar paid. Write: Robert Sanett, 4668 Dockweile Los Angeles, California.

WANTED—Good grid dip meter. W4SK, Box 1656 Delraybeach, Fla.

TA-12, modified for 40/80, less power supply, $20.0 Fred A. Gerdes W5NUN, P.O. 203, Tucumcari, N Mexico. [*Note: The price of $200.00 was printed i error in a previous issue.*]

ELIMINATE TVI. Shield your rig. 26 gauge heav plated bright steel. Perforated 75 #53 holes per inch Easily cut formed and soldered. Sheets 29" x 23" two for $3.50, five for $6.50 postpaid. Sample dime in stamps. Dept. 12, Republic Television, Inc. Dumont, N. J.

TRADE or SALE: TA12 xmtr—150 watts—one knob bandswitching—modified—VFO 80-40-20, xtal 10; plus NC-57 receiver excellent condition, trade for NC173, NC183 or HQ129X or sell for best offer over $200. W3RGN, 1208 Regester Ave., Baltimore Md.

QSLs? SWLs? "America's Finest!" Samples 10¢ Sackers, W8DED, Holland, Mich.

WANTED AN/APR5. Prefer oscillator only but will take complete unit, L. R. Krahe, 363 E. 75 Street, Chicago 19, Illinois.

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WANTED: Bargains in transmitters, receivers, test equipment and miscellaneous gear. What have you? W5ZZ, 718 N. Broadway, Oklahoma City, Okla.

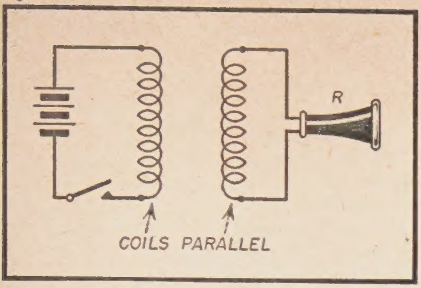

Fig. 3. Edison's wireless circuit.

othing in the record to indicate that Edison's ystem did not work well, but after a time patronge fell off and the system was discarded. Perhaps ıe public was not yet ready for wireless.

Marconi

That the public state of mind can affect the eception accorded an invention is not entirely a ıatter of speculation. It can be shown that only few years later the average man was clamoring or wireless while Marconi was still preparing for is historic test. It is interesting to note that in 903, during the meteoric rise of the Marconi ompany, that firm bought the Edison patent for a song", as Edison phrased it. The statement probably true, for Marconi appeared to have o intention of using it, but purchased it merely prevent its development and exploitation by ther firms. Another point that might have had ome bearing on the matter is that Edison had nplicit faith in, and a very high regard for Maroni. When the news of the Italian inventor's ıccess was received and there was still some oubt as to whether the feat had actually been acomplished, Edison was asked for his opinion. He id, in effect, "If Mr. Marconi says that he has ceived wireless signals from across the Atlantic, en you may be assured that he has done it." uriously enough, the basic idea behind Edison's ireless system came to the fore again about velve years ago when a somewhat similar arngement was used to adjust the tuning and volne level of a home radio receiver from a small ntrol box located a few yards away from the set.

To recapitulate: The development of wireless gnaling up to about 1880 was not rapid, and no artling gains had been made, but several experients had shown that it was possible to dispense ith both of the conductors of a telegraph system d still communicate by means of conduction, duction or even a form of radiation. None of ese systems, however, were based upon true ectric wave communication at high frequencies, hough one brilliant scientist had already prected the existence of waves that he claimed ere closely allied to light waves. But the story of axwell, of Hertz who proved Maxwell's theories d went on to develop a method of generating waves, and of Branly who developed a device detect them will be told in the next installment this series.

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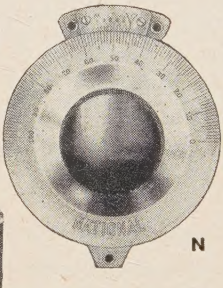

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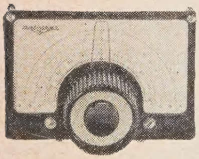

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The HFS is the *only* moderate-priced receiver covering the entire VHF spectrum from 27 mcs. to 250 mcs. in 6 bands. Receives AM, FM and CW with exceptional selectivity and sensitivity. Can be used as either fixed or portable receiver, operating from a standard power supply, 6-volt vibrator-type supply or a combination of "B" and storage batteries.

Can be used as a complete receiver or a converter for any receiver tuning to 10.7 mcs.

In range, versatility, price and performance, the HFS stands alone in the VHF field!

AVAILABLE FOR IMMEDIATE DELIVERY

$142.00* (incl. all coils)

POWER SUPPLY, $22.43*

*Slightly higher west of the Rockies.

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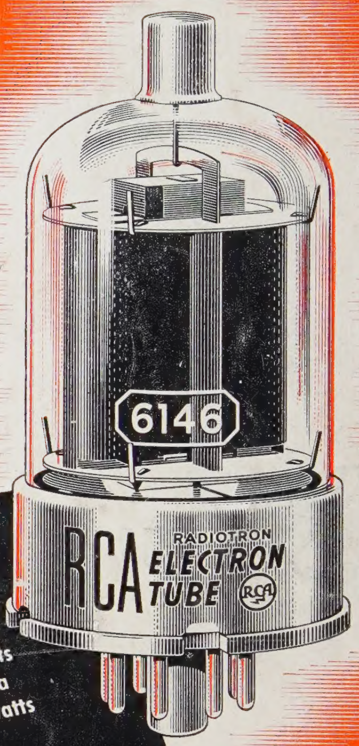
New!

RCA-6146



ACTUAL SIZE

MAXIMUM ICAS* RATINGS

	Below 60 Mc	At 150 Mc
CW		
Plate voltage	750	435 volts
Plate current	150	150 ma
Plate input	90	65 watts
Phone		
Plate voltage	600	350 volts
Plate current	125	125 ma
Plate input	67.5	48 watts

*Intermittent Commercial and Amateur Service

The Fountainhead of Modern Tube Development is RCA

Another RCA advance in Beam Power Tube design

Here's a power tube that will outperform anything in its class. Rated to 175 Mc—only a trifle larger than a 2E26—the new RCA-6146 beam power tube is tailor-made for the amateur 2-meter band.

Rated at a heater voltage of 6.3 volts and current of 1.25 amperes, the RCA-6146 can deliver a CW output (ICAS) of approximately 69 watts at frequencies up to 60 Mc. At 150 Mc, the CW output (ICAS) is approximately 35 watts or better. An RCA-5763 or an RCA-2E26 is an excellent driver for this trim powerhouse.

It goes without saying that the new RCA-6146 incorporates all of the advantages of RCA beam power design . . . including the economy of a low-voltage power supply, and multi-band operation without the requirements of neutralization.

You'll want the full story on this new tube for amateur services. So, ask your local **RCA Tube Distributor** for the technical data bulletin or, write RCA, Commercial Engineering, Section 38AM, Harrison, New Jersey.

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